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—— Serial Number 39 ——

BULLETIN

No. 29

OF THE

UNITED STATES NATIONAL MUSEUM.

PUBLISHED UNDER THE DIRECTION OF THE SMITHSONIAN INSTITUTION.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1885.

Department of the Interior:
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ADVERTISEMENT.

This work (Bulletin No. 29) is the thirty-ninth of a series of papers intended to illustrate the collections of natural history and ethnology belonging to the United States, and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

It has been prepared at the request of the Institution, and printed by authority of the honorable Secretary of the Interior.

The publications of the National Museum consist of two series—the Bulletins, of which this is No. 29, in continuous series, and the Proceedings, of which the eighth volume is now in press.

The volumes of Proceedings are printed, signature by signature, each issue having its own date, and a small edition of each signature is distributed to libraries promptly after its publication.

From time to time the publications of the Museum which have been issued separately are combined together and issued as volumes of the Miscellaneous Collections. These are struck off from the stereotype plates from which the first edition was printed, and in this form are distributed by the Smithsonian Institution to libraries and scientific societies throughout the world. Volume 13 of these collections includes Bulletins 1 to 10 inclusive; volume 19, volumes 1 and 2 of the Proceedings; volume 22, volumes 3 and 4 of the Procedings; and volume 23, Bulletins 11 to 15 inclusive.

Full lists of the publications of the Museum may be found in the current catalogues of the publications of the Smithsonian Institution.

SPENCER F. BAIRD,
Secretary of the Smithsonian Institution.

SMITHSONIAN INSTITUTION,
Washington, August 20, 1885.

RESULTS

OF

ORNITHOLOGICAL EXPLORATIONS

IN

THE COMMANDER ISLANDS AND IN KAMTSCHATKA.

BY

LEONHARD STEJNEGER.

WITH NINE PLATES.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1885.

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PREFATORY NOTE.

The following work has been divided into three parts: (1) a review of the species of birds collected or observed by me on the Commander Islands and at Petropaulski, Kamtschatka; (2) a synopsis of the birds reported to inhabit Kamtschatka, and (3) conclusions. The first and third parts are eminently the "results of my explorations", while the second part is more the "results of my investigations"; however, as it is a necessary base for the "conclusions," it has been thought desirable to incorporate it, the more so since it is the first attempt of a complete list of the birds known to have been observed in Kamtschatka.

The systematical nomenclature will be found to deviate not inconsiderably from the one usually adopted in the publications treating of the region in question. The reason is a two-fold one, for in *identifying* the birds I have been anxious not to lump together nearly-related forms, representative species, subspecies, local races, migrating-route races, or whichever they are termed, giving the separation the benefit of the doubt whenever there be a doubt, it being my scientific creed that this is the least harmful course. In *naming* the forms thus identified I have strictly adhered to the rules laid down by the "American Ornithologists' Union." For changes in nomenclature of that origin I am, therefore, only partly responsible, and eventual critics should not charge against me "the pleasure of bringing forward" these changes, which are the necessary results of the consistent application of the only sound principle upon which a scientific nomenclature can be based. The systematical arrangement is that which I proposed in "Science Record" 1884, p. 155, with a few modifications.

The measurements are given in millimeters. The "total length" is measured by laying the fresh bird on its back on the table in a natural position without stretching its neck, marking the tips of the bill and of the tail on the table, and measuring the distance between the two points. The length of the "tail feathers" is given instead of that of the "tail," the measure being taken by thrusting one arm of the dividers between the two central tail-feathers to their insertion, measuring from that point to the tip of the longest rectrix. The other dimensions have all been taken with sharply-pointed dividers, the arms of which were about 150^{mm} long; dimensions too long to be measured with those were taken by a steel tape measure.

Careful attention has been given to the color of the soft parts which have been recorded only when they could be described from the perfectly fresh bird, and were invariably noted down before skinning it.

Whenever the sex is recorded it has been determined anatomically by myself, except in a few cases where it was determined in a similar way by others, in which case it has been included in parenthesis. In no instance is the sex given from external characters.

For some species a full synonymy has been given, but in most cases only such authors are quoted who have treated of the birds of Kamtschatka and surrounding regions, both on the Asiatic and the American side, directly and particularly. References to general works are therefore only seldom met with. Whenever it has been impossible for me personally to verify a quotation the number of the page has been given in parenthesis. In most cases these have been compared with the citations of several authors, but the present writer disclaims any responsibility for figures thus designated, seeing how generally errors are perpetuated and dispersed by copying references without verifying them.

I have to acknowledge thankfully the aid I received from every person with whom I came into contact during my explorations in that remote corner of the world. It is especially a pleasure to me to mention the many valuable additions to my collection kindly placed in my hands by Governor N. Grebnitski, who, not only during my sojourn on the islands, assisted me in every possible way, but also later sent me a fine series of birds brought together during the year 1883–'84. Captain Hunter, an American gentleman, now residing in Petropaulski, also presented me with a box containing Kamtschatkan birds, and to Mr. John Malavanski my thanks are due for kind assistance in procuring specimens from the neighborhood of Petropaulski while I was away on the islands. To Mr. Carl Osche's skill as a hunter many of the rarer specimens are due, and many of the natives took pride and pleasure in bringing me desirable objects. The officers of the steamer "Alexander", belonging to Messrs. Hutchinson, Kohl, Philippeus & Co., as also the agents of this firm, did all in their power to insure my success. It may also be but just to mention the benefit I derived from Dr. Dybowski's suggestions and communications during the first summer.

I.—REVIEW OF THE SPECIES OF BIRDS COLLECTED OR OBSERVED BY ME ON THE COMMANDER ISLANDS AND AT PETROPAULSKI, KAMTSCHATKA, 1882-1883.

ORDER CECOMORPHÆ.

Superfamily COLYMBOIDEÆ.

Family COLYMBIDÆ.

1. Colymbus holbœllii (Reinhardt).

1827.—*Podiceps rubricollis* Bonap., Spec. Comp., p. 75 (*nec* Gmel., 1788).—Swinh., P. Z. S., 1863, p. 322.—Blakist. & Pryer, Tr. As. Soc. Jap., X, 1882, p. 93.—Blakist., Amend. List B. Jap., p. 23 (1884).

1849.—*Podiceps rubricollis major* Temm. & Schleg., Faun. Jap. Av. (pl. 78 B), (*nec P. major* (Bodd.), 1783).—*P. subcristatus* var. *major* Dybow., J. f. Orn., 1868, p. 339.

1853.—*Podiceps holbœllii* Reinhardt, Vidensk. Meddel., 1853 (p. 76).—Nelson, Cruise Corwin, p. 114 (*polbölli!* err. typ.) (1883).

1858.—*Podiceps griseigena* Lawr., in Baird's B. N. Amer., p. 892 (*nec* Bodd., 1783).—Dall and Bannist., Tr. Chicag. Acad., I, 1869, p. 308.—Finsch, Abh. Brem. Ver., III, 1872, p. 76.—Coues, in Elliott's Aff. Alaska, p. 201 (1875).—Elliott, Monogr. Seal Isl., p. 133 (1882).

1858.—*Podiceps cooperi* Lawr., in Baird's B. N. Amer., p. 893.—Finsch, Abh. Brem. Ver., III, 1872, p. 75.

1858.—*Podiceps subcristatus* Kittl., Denkw., II, p. 313 (*nec* Jacq., 1784).—Schrenck, Reis. Amurl., I, p. 493, pl. 15, fig. 3 (1860).—Radde., Reis. Süd. Ost- Sibir., II, (p. 381) (1863).—Przew., Putesch. Ussur. (*n.* 219) (1870).

1866.—*Podiceps affinis* Salvadori, Atti Soc. Ital. Sc. Nat., VIII, 1866 (p. 45).

1874.—*Podiceps cucullatus* Taczan., J. f. Orn., 1874, 336 (*nec* Pall. 1826).—*Id.*, *ibid.* 1875, p. 257.—*Id.*, *ibid.*, 1876, p. 203.—*Id.* Orn. Faun. Vost. Sibir., p. 72 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 49.—*Id.*, *ibid.*, 1883, p. 245.

The large Eastern Asiatic representative of *Colymbus grisegena* Bodd. is usually designated by the name *C. cucullatus* Pall.* An examination of Pallas's account of the latter in his Zographia Rosso-Asiatica, renders plain that he only had the European and West Siberian form before him, and that consequently the name becomes only a synonym of *grisegena* proper.

In the first place about the habitat. He says: "In Rossiæ et Sibiriæ lacubus non infrequens, præsertim per campos Ischimenses et Barabenses copiosior. Borealiores regiones vix videtur adire." No special mention is made of its occurrence in Eastern Asia, and to any one familiar with Pallas's work and the explicit way in which he describes the habitat of birds also found in that region the above reference is ample proof that Pallas did not know of its occurrence in Eastern Siberia. The description of the colors applies just as well to one form as to the other, and needs therefore no further consideration. But not so the measurements. He gives the total length as 15 inches 7 lines, wing as 6 inches 7 lines, tarsus 1 inch 9 lines, outer toe 2 inches 8 lines; while the eastern form has these corresponding dimensions, 20 inches, nearly 8 inches, 2½ inches, and 3 inches, while his measurements agree closely with those of European birds. The length of "rostrum" is given as 2 inches, which probably means the length along the commissure, which in the eastern form is more than 2½ inches long.

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* Taczanowski writes persistently "*P. cucullatus* Lath." I have not been able to find such a name in Latham's writings.

This disposes of Pallas's *cucullatus.*

Mr. Severzow suggests that the so-called *C. longirostris* Bp., of which specimens are known from Italy, may possibly belong to the East-Asiatic form, having straggled as far as Italy. Th. Salvadori has left us a good account of a specimen of the Italian bird accompanied by measurements. (Catal. Ucc. Sardegna, p. 136, Milan, 1864.) Judging from what he says, the Mediterranean form must be something entirely different, however.

In the first place he describes the bill as different from that of *grisegena* by being recurved like that of "*P. auritus* LATH."* "verso l'apice rivolto in alto come nel P. a,") a feature not at all shared by the East Siberian form. Finally his measurements indicate quite different proportions. With a bill of excessive length it combines general dimensions inferior to those of the eastern form, although somewhat larger than the common European bird, as a comparison of his measurements, as given below, with those of eastern birds in the appended table of dimensions clearly proves. Here are the measurements of the specimens in the museum at Cagliari as given by Salvadori: Commissure, 88^{mm}; exposed culmen, 76^{mm}; from tip of bill to anterior border of nostrils, 63^{mm}; tarsus, 60^{mm}; outer and middle toes, 72^{mm}; wing, 180^{mm}. The name *C. longirostris* BP. is not tenable, however, as the Sardinian bird certainly is distinct from Bonnaterre's *C. longirostris* of 1790 (Enc. Meth. Orn.,

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**Nec* LIN. Is the same as *Colymbus nigricollis* BREHM.

I, p. 54), which, having a bill "*d'environ deux pouces,*" cannot be anything but the common European form. In that case it will be necessary to give the Sardinian bird a new name. It might fitly be called *Colymbus salvadorii.**

A comparison of my specimen from Eastern Asia with a good series of typical *grisegena* from Europe and typical *holbœllii* from North America has convinced me that they really belong to the latter form. My material indicates no intergradation, and none has been reported so far as I know, so that a trinominal like *Colymbus grisegena holbœllii* seems totally unwarranted for the present at least.

In my private collection is a specimen collected by Dr. Dybowski, at the Bay of Abrek, Premorskoj Government, Eastern Siberia, of which measurements are included in the appended table:

Table of measurements.

Collection.	Museum No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Exposed culmen.	Commissure.	Tarsus.	Outer toe with nail.
				1882.		*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
U. S. Nat. Mus ...	92918	1752	Bering Island	Nov. 24	♀	462	......	......	......	......	......
				1875.							
Stejneger	707	......	Bay of Abrek	June 23	♂ ad.	(522)	208	48	68	67	76

No. 92918.—Iris, light orange yellow; bill, greenish yellow, at base tinged with reddish brown; culmen and nasal fossæ blackish brown, becoming paler toward the tip; naked skin of mental angle greenish yellow. Inner aspect of feet greenish yellow, shaded with dark on the joints; lobes orange-colored next to the toes; outer aspect, and toes below, blackish. Stomach filled with a green mass, chiefly consisting of feathers, however.

The Great Red-necked Grebe does not appear at the islands, except as a rare straggler. A single specimen was taken at Saranna, Bering Island, late in November, 1882.

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* The synonymy of the typical *Colymbus grisegena* will stand as:

1783.—*Colymbus grisegena* BODD., Tabl. Pl. Enl., p. 55 (Ed. Teget.).
1784.—*Colymbus subcristatus* JACQ., Beitr. Gesch. Vög., p. 37.
1786.—*Colymbus parotis* SPARRM., Mus. Carls. (pl. 9).
1787.—*Podiceps ruficollis* LATHAM, Syn. Suppl., I, p. 294.
1788.—*Colymbus rubricollis* GMEL., Syst. Nat., I, 2, p. 592.
1790.—*Colymbus longirostris* BONNAT., Enc. Meth Orn., I, p. 54 (*nec* BR.).
1826.—*Colymbus cucullatus* PALL., Zoogr. Ross. As., II., p. 355.
1831.—*Podiceps canogularis* BREHM, Handb. Vög. Deutschl., p. 958.

2. Colymbus auritus Lin.

1758.—*Colymbus auritus* Lin., Syst. Nat., 10 ed., I, p. 135.—*Podiceps a.* Whitely, Ibis 1867, p. 209.—*Dytes a.* Nelson, Cruise Corwin, p. 114 (1883).

1788.—*Colymbus cornutus* Gmel., Syst. Nat., I, p. 591 (*nec* Pallas, 1826).—*Podiceps c.* Middend., Sibir. Reis., II, 2 (p. 238), (1853).—Schrenck, Reis. Amurl., I., p. 492.—Radde, Reis. Süd. Ost-Sibir., II (p. 381).—Swinh., P. Z. S., 1863, p. 322.—*Id.*, *ibid.*, 1871, p. 415.—Dall & Bannist., Tr. Chicag. Acad., I, 1869, p. 308.—Finsch, Abh. Brem. Ver., III, 1872, p. 76.—Taczan., J. f. Orn., 1873, p. 1108.—*Id.*, *ibid.*, 1874, p. 336.—*Id.*, *ibid.*, 1876, p. 203.—*Id.*, Orn. Faun. Vost. Sibir., p. 72 (1877).—*Id* , Bull. Soc. Zool. France, 1877, p. 49.—Blakist. & Pryer, Ibis, 1878, p. 211.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 181.—*Iid.*, *ibid.*, X, 1882, p. 92.—Seeb., Ibis, 1879, p. 21.—*Id.*, *ibid.*, 1882, p. 369.—Hartlaub, J. f. Orn., 1883, p. 284.—Blakist., Amend. List B. Jap., p. 8 (1884).

The Horned Grebe is of rare occurrence on the islands, probably only an accidental straggler and not a regular migrant. It certainly does not breed there anywhere. The only evidence of its occurrence which I possess is a skeleton which one of the natives had made several years ago from a specimen obtained at Bering Island.

This specimen, No. 17273 of the osteological collection of the United States National Museum (L. Stejneger, No. 1952) measures as follows: Bill along commissure, 29^{mm} ; tarsus, 43^{mm}.

Superfamily ALCOIDEÆ.

Family URINATORIDÆ.

3. Urinator adamsii (Gray).

1835.—*Colymbus glacialis* Ross, Narr. Voy. N. W. Pass., p. — (*nec* Lin.).—Middend., Sibir. Reis., II, 2, p. 238 (*part*).

1836.—*Colymbus hiemalis* Wiegm., Arch. Naturg., 1836, p. 200 (*nec* Brehm).

1859.—*Colymbus adamsii* G. R. Gray, P. Z. S. 1859, p. 167.—Dall & Bannist., Tr. Chicag. Acad., I, 1869, p. 308.—Finsch, Abh. Brem. Ver., III, 1872, p. 72.—Swinh., Ibis, 1877, p. 146.—Seeb., Ibis, 1879, p. 22.—Blakist. & Pryer, Tr. As. Soc. Jap., VIII, 1880, p. 181.—*Iid.*, *ibid.*, X, 1882, p. 94.—Nelson, Cruise Corwin, p. 114 (1883).—Taczan., Bull. Soc. Zool. France, 1883, p. 345.—Blakist., Amend. List B. Jap., p. 33 (1884).

1872.—*Colymbus torquatus* var. *adamsii* Coues, Key, p. 334.

The White-billed Loon is a winter visitor to the Commander Islands of rather rare occurrence, but at least one was observed by me, apart from the one specimen I obtained for my collection.

This was caught in a rather curious manner. It was found sitting on the smooth ice of Lake Saranna (November 25, 1882), unable to run upon or lift from the glib surface. It evidently had mistaken the transparent and shining ice for open water.—Ritter v. Tschusi-Schmidhofen relates a similar mistake on the part of a flock of coots, *Fulica atra* L. (Cf. Journ. f. Orn., 1874, p. 343).

This species is distinguished by the natives from the following as "Bolschoj Gagara."

The specimen measures as follows:

♀ jun. U. S. Nat. Mus., No. 92916; L. Stejneger, No. 1753. Bering Island, November 25, 1882.

Total length, 777^{mm}; wing, 355^{mm}; tail-feathers, 65^{mm}; exposed culmen, 71^{mm}; commissure, 102^{mm}; bill from tip to posterior border of nostrils, 62^{mm}; height of bill at fore border of nostrils, 22^{mm}; tarsus, 90^{mm}; outer toe, with claw, 121^{mm}. Weight, 5¼ pounds.

Remarks.—Iris brown. Bill light bluish gray, towards base somewhat violet; culmen and tomia blackish. Outer aspect of feet blackish brown; inner aspect bluish white, with dark brownish gray on the joints, on the two inner phalanges of the outer toe, and on the webs along the outer and middle toes.

The stomach did not contain anything but half a dozen stones of the size and shape of beans.

The specimen is a bird of the year, but can nevertheless, without doubt, be referred to *adamsii*. In the adult winter-plumage this species and *imber* are readily distinguishable by the bill, which in the latter is shorter than the tarsus, while in the former it is longer. This cannot be done so easy in the young of the year, however, as at that age the bill has not yet reached its full and final length. The feet, on the other hand, are already of the same size as those of the adult, while the height of the bill is also much greater than in the corresponding age of *imber*, so that the young *adamsii* may be identified by the very large feet and the high bill, features which are very pronounced in the specimen collected by me. The average length of the tarsus in *adult imber* measures about 78^{mm}; the same dimension in my young bird is 90^{mm}; in the former the average length of the outer toe with claw is 111^{mm}, against 121^{mm} in the Bering Island specimen. As to the young of *imber* the height of the bill is about 16 to 18^{mm}, against 22^{mm} in my bird, which in that respect even exceeds the old *U. imber*.

4. Urinator lumme (GUNN.).

1761.—*Colymbus lumme* GUNN., Act. Nidr. I, pl. ii, fig. 2.—*Urinator l.* TURNER, Auk, 1885, p. 159.

1764.—*Colymbus stellatus* BRÜNN., Orn. Bor., p. 39.

1764.—*Colymbus borealis* BRÜNN., Orn. Bor., p. 39.

1766.—*Colymbus septentrionalis* LIN., Syst. Nat., 12 ed., I, p. 220.—MIDDEND., Sibir. Reis. II, 2 (p. 329), (1853).—KITTL., Denkw., II, p. 282, (1858).—SCHRENCK, Reis. Amurl., I, p. 496, (1860).—RADDE, Reis. Süd. Ost-Sibir., II, (p. 382), (1863).—SWINH., P. Z. S., 1863, p. 322.—*Id.*, *ibid.*, 1871, p. 415.—*Id.*, Ibis, 1863, p. 433.—*Id.*, *ibid.*, 1874, p. 163.—WHITELY, Ibis, 1867, p. 208.—DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 307.—FINSCH, Abh. Brem. Ver., III, 1872, p. 75.—DALL, Avif. Aleut. Isl. west Unal., p. 10 (1874).—TACZAN., Orn. Faun. Vost. Sibir., p. 73 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 50.—*Id.*, *ibid.*, 1882, p. 398.—Blakist. & Pryer, Ibis, 1878, p. 211.—*Id.*, Tr. As. Soc. Jap., VIII, 1880, p. 181.—*Id.*, *ibid.*, X, 1882, p. 94.—Nelson, Cruise Corwin, p. 115 (1883).—Hartlaub, J. f. Orn., 1883, p. 284.—Blakist., Amend. List B. Jap., p. 8 (1884).—*Cepphus s.* Pallas, Zoogr. Ross. As., II, p. 342 (1826).—*Eudytes s.* Normann, in Erman's Verzeichn. Thier. Pflanz., p. 18 (1832).

1774.—*Colymbus glacialis* Phipps, Voy. North Pole, p. —— (*nec* Lin.).—Swinhoe, Ibis, 1860, p. 67.— *Id.*, *ibid.*, 1861, pp. 268, 345, 410.

1783.—*Colymbus immer* Bodd., Tabl. Pl. Enl., p. 58 (Ed. Teg.) (*nec* Brünn., 1764).

1788.—*Colymbus striatus* Gmel., Syst. Nat., I, 2, p. 586.

1810.—*Colymbus rufogularis* Mey. & Wolf, Taschb. Deutsch. Vogelk., II, p. 453.

1826.—*Colymbus mülleri* Brehm, Isis, 1826, p. 984.

1831.—*Colymbus stellaris* Lesson, Traité d'Orn., p. 637.

1855.—*Colymbus microrhynchos* Brehm, Naumannia, 1855, p. 300.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Sex and age.	Locality.	Date.	Wing.	Tail feathers.	Expos. culmen.	Tarsus.	Outer toe with claw.	Total length.
				1882.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89118	1147	♀ad.	Bering Island	June 3	155	48	50	72	88	605
92917	1398	juv.	......do	Aug. 5	......	......	......	......	......	480

No. 89118.—Iris reddish brown. Bill black, culmen yellowish gray, lighter towards the base.

No, 92917.—Iris dark hazel. Bill light bluish gray, culmen blackish. Feet bluish white; outer aspect, webs along the toes, and joints blackish.

The "*Gagara*" occurs very abundantly on Bering Island during the summer. Even on very small ponds a breeding pair is regularly found, and on the greater lakes several pairs take up their quarters, not in company, however, but each pair by itself, occupying its own corner of the lake.

On Copper Island suitable localities are very scarce, but in a few places they breed, nevertheless. Thus, on July 30, 1883, I found a pair at Pestschanoj Ozero, a few miles from the village.

They appear in spring rather late, as the first ones were observed about the 1st of May, the bulk not arriving before the 7th (1883). Fresh eggs were taken on June 2, 6, and 21. These measure as follows:

U. S. Nat. Mus. No.	Stejn. No.	Lg. diam.	Sh. diam.
		mm.	*mm.*
21778	1146	77.5	46
21779	2195	76	46
21780	2196	72	47

Family ALCIDÆ.

5. Uria lomvia arra (Pall).

1822.—*Uria brunnichii* Choris, Voy. Pittor., Aléout., pl. xxi (*nec* Sab.)—Blakist. & Pryer, Ibis, 1878, p. 211.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 180.—*Iid.*, *ibid.*, X, 1882, p. 91.—Seeb., Ibis, 1882, p. 369.—Blakist., Amend. List B. Jap., p. 32.

1826.—*Cepphus arra* Pall., Zoogr. Ross. As. II, p. 347.—*Uria a.* Cassin, Pr. Philada. Acad., 1862, p. 324.—Dall & Bannist., Tr. Chicag. Acad., I, 1869, p. 309.—Taczan., Bull. Soc. Zool. France, 1882, p. 398.—Stejneger, Naturen, 1884, p. 54.—*Lomvia a.* Coues, in Elliott's Aff. Alaska, p. 211.—Elliott, Monogr. Seal Isl., p. 135 (1882).—Nelson, Cruise Corwin, p. 117 (1883).

1826.—*Cepphus lomvia* Pall., Zoogr., Ross. As., I, p. 345 (*part*).—Taczan., Orn. Faun., Vost. Sibir., p. 74 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 51.

1832.—*Uria troile* Kittl., Isis, 1832, p. 1104 (*nec* Lin.).—*Id.*, Denkw., I, p. 302; II, p. 224 (1858).—Finsch, Abh. Brem. Ver., III, 1872, p. 78.

1884.—*Uria lomvia arra* Ridgw. in B. Br. & Ridgw. Water B. N. Amer., II, p. 485.—Turner, Auk, 1885, p. 159.

Dr. Coues, in his Monograph of the *Alcidæ*, places *Cepphus lomvia* of Pallas, with a query as a synonym under *Lomvia californica*, and remarks that "it is possible that this species rather than *troile* is alluded to by Pallas under the name of *Cepphus lomvia*" (Pr. Philada. Acad. 1868, pp. 79 and 80). Of the thick-billed Guillemot, from the Pribilof Islands, he says: "This bird is, of course, the true *arra* of Pallas" (Elliott's Aff. Alaska, p. 211).

But Pallas's birds are not so easily disposed of, as an inspection of his descriptions will show. It will be borne in mind that the chief distinction between the two Pacific forms is to be found in the bill, the one having a thick, robust beak, with dilated and naked tomia at the base of the upper mandible, while in the other the bill is slender, weak, and feathered along the base of the maxillar edge, the latter form being Bryant's *californica*.

Pallas gives a comparison of the bills of the two forms, described by him as *lomvia* and *arra* (Z. R. A., II, p. 347) in which he says: "Contra in *Lomvia* Camtschatica angulus rostri frontalis obsolete canaliculatus et carina sulco excavata [*scr.* excarata] *laterales* vero *rostri margines longe citra nares, ad fraenum oris usque nudi; quod non in Arra.* Anguli plumosi ultra nares procurrentes, carina curvilinea, nec angulata." This description does not leave the slightest trace of doubt that his *C. lomvia*, at least as far as his Pacific specimens are concerned, is the thick-billed form with the naked tomia, and, consequently, that it is *not* a synonym of *californica*. This will be the more plain if we look at his description of the bill of his *arra* on the same page: "Magnitudo et habitus omnino

O. Lomviæ, sed rostrum minus et divertissimum, brevius, ***compressius***, ***minus robustum***, superius magis curvilineum, ... ***basi minus denudatum.***"

It may now be asked, what is, then, *C. arra?* Is it the slender-billed form, equal to *californica*, and will it have to take the precedence over the latter name? Pallas says expressly that the tomia at base are ***not*** dilated and denuded: "quod non in *Arra.*"

I was myself very much puzzled by this question, and would probably have answered it in the affirmative had it not been for a specimen which I collected on Bering Island. It (No. 92934) is a bird of the year—not much more than six months old—and undoubtedly belonging to the thick-billed form, as is evident at the first glance, and still more so upon a close comparison with the *californica* of the same age. From this bird it is clear that the thick-billed species in the first year has the basal part of the tomia *feathered and not dilated*, the bill being at the same time much ***shorter*** *and more compressed* than in the old birds. Compared with *californica* of the same age it differs especially in the greater robustness and height of the bill, and especially by the much shorter gonys, the relative length of which is particularly diagnostic of the two species. What confirms my opinion that Pallas's *arra* is his *lomvia* in the first winter, is his expression "***superius*** *magis curvilineum*," which will not fit *californica* in any stage of growth. I therefore think that we are justified in retaining the name "*arra*" for the thick billed Pacific form.

Dr. E. Coues was the first author to point out the differences between the Atlantic and the Pacific forms of the Thick-billed Guillemot (Elliott's Aff. Alaska, p. 211 (1875)), but he did not recognize it as worthy of a special name until in the second edition of his "Key," where the Atlantic bird is called *Lomvia arra svarbag*, and the Pacific simply *L. arra*, but under the system of nomenclature followed in the "Key" the Atlantic should have been called *Lomvia svarbag* and the Pacific *Lomvia svarbag arra*, as Pallas's name is later than that given by Brünnich.

For my own part the inspection of ample material has convinced me that the two forms are separable, and even better so than *troile* and *troile californica.*

The "*Are*"* is extremely abundant at the Commander Islands, and is perhaps at present the most numerous species of the region, although it is difficult to say whether *Lunda cirrhata* is not just as rich in individuals. Next come *Fulmarus glupischa* and *Phalacrocorax pelagicus*. It is by far more numerous, however, on Copper Island than on Bering Island, there being hardly an Are rookery on the whole northern part of the latter island, except on the outlying Arij-Kamen and at the northeastern corner.

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* The Russian name, derived from the voice of the bird, an angry ar-r-r, is originally applied to *U. troile* in Europe, and is consequently not specific for the Pacific form which Pallas called *C. arra.*

They pass the winter away from the shores of the islands, probably on the open sea not far from them, as is indicated by living individuals occasionally appearing during the winter and dead bodies regularly cast ashore after each severe storm of that season.

About the 1st of April, or a little earlier, their enormous flocks approach the shore and take possession of the rookeries.

When breeding, the long rows of Ares on the narrow shelves of rock, where they have deposited their many-colored, large, pear-shaped egg, face the rocky wall with their white breasts, turning their black backs to the spectator. When flying off the nest they consequently are compelled to first turn round, and, if taken by surprise, this maneuver will often cause them to throw the egg from the shelf into the water. It happened several times when I stealthily approached in a boat under the breeding colonies, that several eggs were thrown into the boat when the birds rushed off the nests, if the bare rock upon which the egg is placed can be called a nest, and my Aleutian oarsmen were always in a roar of laughter when one of these projectiles exploded on the head of an unfortunate comrade.

A series of eggs of all shades, from white to deep greenish blue, were collected, and measure as follows:

U. S. Nat. Mus. No.	Stejn. No.	Lg. diam.	Sh. diam.
		mm.	*mm.*
21811	1217	79	50
	1218	81. 5	50
	1219	84	51
	1220	78. 5	48
	1221	81. 5	53
	1222	81	52
	1223	83	51
	1224	79	48

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail feathers.	Culmen.	Gonys.	Height of bill at nostrils.	Tarsus.	Middle toe with claw.
			1883.		*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92934	1834	Bering Island	Jan. 3	♀ jun.	422	7	201	45	38	17	13	37	56
92935	2548	....do..........	Sept. 2	juv.	......	......	85	......	19	9	7	32	41
92936	2547	....do..........	Sept. 2	juv.	......	......	83	......	19	10	7	30	39

No. 92934.—Bill dark, almost blackish, bluish gray, with a light spot on gonys in front of the angle. Feet light bluish pearl-gray, with a faint yellowish tinge in front (not greenish, however); joints darker bluish gray, underneath blackish gray.

6. Uria troile californica (Bryant).

1822.—*Uria troile* Choris, Voy. Pittor., Aléout., pl. xx.—*Uria t.* Blakist. & Pryer, Ibis, 1878, p. 211.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 180.—*Iid.*, *Ibid.*, X, 1882, p. 91.—Blakist., Amend. List B. Jap., p. 32 (1884).—*Lomvia t.* Bean, Pr. U. S. Nat. Mus., 1882, p. 172.

1859.—*Uria brünnichii* Heermann, Pacific R. R. Rep., X, Route to Calif. B. (p. 75), (*nec* Sab.).

1861.—*Catarractes californicus* Bryant, Pr. Bost. Soc. N. Hist., 1861, p. 142.—*Uria c.* Dall & Bannist., Tr. Chicag. Acad., I, 1869, p. 309.—Finsch, Abh. Brem. Ver., III, 1872, p. 77.—Dall, Avif. Aleut. Isl. Unal. eastw., p. 10 (1873).—*Id.*, Avif. Aleut. Isl. west. Unal., p. 10 (1874).—Stejneger, Naturen, 1884, p. 54.

1872.—*Lomvia troile* var. *californica* Coues, Key N. Amer. B., p. 346.—*Id.*, in Elliott's Aff. Alaska, p. 210 (1875).—Elliott, Monogr. Seal Isl., p. 135 (1882).—Nelson, Cruise Corwin, p. 117 (1883).

The California Guillemot occurs only in very limited numbers on the rookeries among the enormous masses of *U. arra*, the thick-billed species. Nothing particularly can be said about the present bird, as it is practically undistinguishable from the *arra* when on the rookery. Apparently they arrive, breed, and depart in company with the common *arra*, and are also found at sea around the islands like the latter during winter-time, as the specimen in my collection proves.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail feathers.	Culmen.	Gonys.	Height of bill at nostrils.	Tarsus.	Middle toe with claw.
			1882.		*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89092	1022	Bering Island..	May 9	♀ ad.	380	......	102	45	37	23	11	37	54
92944	1828	......do........	Dec. 29	......	431	5	192	45	38	23	11	40	54

No. 89092.—Iris dark brown. Feet light yellowish gray, webs darker. Bill black; angle of mouth yellowish.

No. 92944.—Iris dark brown. Bill blackish brown, somewhat lighter on the middle of gonys. Feet light yellowish to brownish gray, joints and webs a little darker, tarsus and toes below blackish. Sexual organs indistinguishable.

Birds of the year of the two forms, *californica* and *arra*, may be distinguished thus: *Californica* has the culmen less curved, the gonys long, much longer than half the culmen, and the bill lower; the greater under wing-coverts are gray with white edgings; the shafts of the first primaries above are very light, nearly white; the color of the upper head and neck is more tinged with brownish. *Arra* has the culmen more curved, the gonys short, about half the length of the culmen, and the bill higher; the greater under wing-coverts darker and uniform gray without white edgings; the shafts of the primaries dark brownish; the color of the upper head and neck more glossy and black.

7. Cepphus columba Pallas

1790.—*Uria grylle β* Latham, Ind. Orn., II, p. 797.

1826.—*Cepphus columba* Pall., Zoogr. Ross. As., II, p. 348 (*part.*).—Turner, Auk, 1885, p. 159.—*Uria c.* Cassin, U. S. Explor. Exped. Ornith., p. 346 (1858).—*Id.*, in Baird's B. N. Amer., p. 912 (1858).—*Id.*, Pr. Acad. Philada., 1862, p. 323.—Swinh., P. Z. S., 1863, p. 330.—Dall & Bannist., Tr. Chicag. Acad., I, 1869, p. 309.—Finsch, Abh. Brem. Ver., III, 1872, p. 78.—Dall, Avif. Aleut. Isl. Unal. eastw., p. 11 (1873).—*Id.*, Avif. Aleut. Isl. west Unal., p. 10 (1874).—Taczan., Orn. Faun. Vost. Sibir., p. 73 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 51.—*Id.*, *ibid.*, 1883, p. 398.—Blakist. & Pryer, Tr. As. Soc. Jap-X, 1882, p. 91.—Bean, Pr. U. S. Nat. Mus., 1882, p. 172.—Nelson, Cruise Corwin, p. 117 (1883).—Hartlaub, J. f. Orn., 1883, p. 285.

1832.—*Uria grylle* Kittlitz, Isis, 1832, p. 1105 (*nec* Lin.).—*Id.*, Denkw. Reise, I, pp. 273, 291.—*Cepphus g.* Whitely, Ibis, 1867, p. 210.

This is the "*Kajurka*" of the natives, who do not recognize them by the Russian name "*Svistun.*"

The Pigeon Guillemot is a very common bird all around the shores of both islands, although not by far so numerous as several other *Alcidæ*, for instance, *Uria arra* and *Lunda cirrhata.* They are mostly found in single pairs. It has been denied that they ever congregate in large flocks, but this is not absolutely correct, for on several occasions I observed flocks of them, especially on June 4, 1883, when I visited the small island Toporkof, opposite the village of Bering Island. The whole islet was covered with hundreds and hundreds of birds in their full black summer plumage, collected into larger and smaller flocks, generally consisting of about fifty or more.

In 1883 the first arrivals were noted on the 14th of March. On Copper Island a nest containing two eggs (the usual number) was taken June 16, measuring 58 by 41^{mm}, and 58 by 40^{mm} (U. S. Nat. Mus. No. 21777; L. Stejneger No. 2211).

Downy young just out of the shell were collected at the same place on July 20, 1883. They are covered with a black down, and are in every respect similar to those of *Cepphus grylle.*

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail feathers.	Exposed culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89098	1037	Bering Island	May 11, 1882	♂ ad.	347	......	168	55	30	35	50
92940	2017	......do	May 8, 1883	♂ ad.	335	13	169	51	29	35	46
92941	2016	......do	May 8, 1863	♀ ad.	342	16	173	53	31	35	49
92942	2018	......do	May 8, 1883	♀ ad.	355	8	177	55	32	35	46
92943	1469	......do	Aug. 15, 1882	♀ jun.	316	......	163	45	30	34	46
92937	2774	......do	Sept. —, 1883	juv.	......	......	143	47	23	34	43
92938	2270	Copper Island.......	July 20, 1883	pull.	164	......	......	......	14	20	26
92939	2269	......do	July 20, 1883	pull.	129	....	......	......	11	16	20

No. 92940.—Iris dark brown. Bill black. Feet deep vermillion; nails black. Fat. Stomach and crop empty. Only a few feathers in their sheaths.

No. 92941.—Colors as foregoing. Feathers all over the body still partly in their sheaths.

No. 92939.—Iris dark brown. Bill reddish black, with a white knob at the tip; angle of mouth brownish red flesh-color; interior of mouth pale salmon color. Feet reddish gray; webs lighter; tarsus behind blackish.

I have seen it stated somewhere—without now being able to lay hand on the reference—that the Black Guillemots pass from the white winter-plumage to the black breeding garb without moult. The idea, however, is quite erroneous, as amply proven by the remarks above.

8. Cepphus carbo PALLAS.

1826.—*Cepphus carbo* PALL., Zoogr. Ross. As. II, p. 350.—STEJNEGER, Pr. U. S. Nat. Mus. VII, Aug. 5, 1884, p. 225.—*Uria c.* MIDDEND., Sibir. Reis. II, 2 (p. 239, pl. xxiii, fig. 6), (1858).—CASSIN, Pr. Philada. Acad. 1862, p. 323.—SCHRENCK, Reis. Amurl. I, p. 496, pl. xvi, fig. 1 (1863).—BRANDT, Mel. Biol. VII, 1869, p. 206.—SWINH., Ibis, 1875, p. 458.—TACZAN., J. f. Orn., 1876, p. 203.—*Id.*, Orn. Faun. Vost. Sibir., p. 73 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 51.—BLAKIST. & PRYER, Ibis, 1878, p. 211.—*Iid.*, Tr. As. Soc. Jap. VIII, 1880, p. 180.—*Iid.*, *ibid.*, X, 1882, p. 90.—BLAKIST., Amend. List B. Jap., p. 32 (1884).—*Alca c.* SCHLEGEL, Mus. P. B. Urinat., p. 17 (1867).

The Pacific Sooty Guillemot seems to be restricted to a very limited area, not being regularly found beyond the coasts of the Okotsk Sea, and the Sea of Japan. Pallas's statement that it is frequent about the Aleutian Islands, especially Unalashka is incorrect beyond doubt (cf. my memoir, Pr. U. S. Nat. Mus. VII, 1884, pp. 224–227), although stragglers of a marine species like the present may be expected in the adjacent waters.

I introduce this species as an accidental visitor to the Commander

Islands only on the strength of two pairs, which were observed by me at rather close quarters, but not shot.

In the evening of the 28th of April, 1883, I saw four black "Kajurkas" sitting on stones a little off shore to the south of the so-called "Reef Mys," near the village of Bering Island. I had good opportunity of watching them with an excellent field glass, but as the tide was running out and no boats or bajdarkas in the neighborhood, it was useless to try to shoot. They were uniform blackish without any white whatever on the wings, and the light patch on the eye-region was plainly visible, so that there cannot be the slightest doubt as to the correctness of the identification. I had been on a sharp lookout for this species during the whole spring season, and offered the native hunters a good reward for a wholly black "Kajurka," without white on the wings, but without results. That, during the following weeks I regularly revisited the place where at first I observed them, may be taken as almost a matter of course, but I never saw them again.

9. **Synthliboramphus antiquus** (Gmel.)

1788.—*Alca antiqua* Gmel., Syst. Nat. I, p. 554.—Schlegel, Mus. P. B. Urinat, p. 21. (1867).—*Uria a.* Kittlitz, Isis, 1832, p. 1104.—Temm. & Schleg., Faun. Jap. Av. (p. 124, pl. 80) (1849).—Schrenck, Reis. Amurl. I, p. 499 (1860).—Swinh., P. Z. S., 1863, p. 330.—*Id.*, Ibis, 1874, p. 166.—Whitely, Ibis, 1867, p. 209.—*Brachyrhamphus a.* Dall & Bannist., Tr. Chicag. Acad., I, 1869, p. 310.—Dall, Avif. Aleut. Isl., west Unal., p. 11 (1874).—Blakist. & Pryer, Ibis, 1878, p. 210.—*Iid.*, Tr. As. Soc. Jap. VIII, 1880, p. 180.—*Iid.*, *ibid.*, X, 1882, p. 90.—Blakist., Amend. List B. Jap., p. 8, (1884).—*Synthliborhamphus a.* Finsch, Abh. Brem. Ver., III, 1872, p. 80.—Dall, Avif. Aleut. Isl. Unal. eastw., p. 11 (1873).—Taczan., J. f. Orn., 1876, p. 203.—*Id.*, Orn. Faun. Vost. Sibir., p. 74 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 51.—*Id.*, *ibid.*, 1883, p. 345.—Bean, Pr. U. S. Nat. Mus., 1882, p. 171.—Nelson, Cruise Corwin, p. 116 (1883).—Turner, Auk, 1885, p. 159.

1826.—*Uria senicula* Pallas, Zoogr. Ross. As., II, p. 367.

1837.—*Brachyramphus brachypterus* Brandt, Bull. Scientif., II, 1837, p. 346.

1839.—*Mergulus cirrhocephalus* Vigors, Zool. Blossom, Orn., p. 32.

1858.—*Uria cana* Kittlitz, Denkw. Reise, I, p. 288.

The *Starik* (=old man, so called probably from the white hair-like feathers on the head; hence Gmelin's name *antiquus* and Pallas's *senicula*) breeds on both islands, but only sparingly at Bering Island. In fact, the only place where I know it to nest with certainty on the latter is in the cliffs of the outlying islet Arij Kamen. On Copper Island it is more numerous, without being common there either.

They seem to pass the winter on the open ocean, not far from the islands, however, as two were seen and one was shot at Bering Island

January 3, 1883 (No. 92985). In 1883 they approached land during the first week of May.

During the voyage from San Francisco to the Commander Islands in the beginning of May, 1882, these birds were frequently observed on the ocean on both sides of the Aleutian chain, but out of sight of land. They would swim close to the steamer's side, so near as even to touch it and to be turned around when striking the vessel; when it had passed them about a little more than half its length they would suddenly dive, coming up again away behind us; then they would take to the wing and drop just a little to the right or the left of our bow, repeating this maneuver over and over again.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail feathers.	Culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92985	1843	Bering Island	Jan. 3, 1883	♂ ad..	260	0	135	34	14	28	33
92987	2201	Copper Island.......	June 16, 1883	(♂) ad.	......	......	133	33	13	30	......
92986	2224	......do...............	July 3, 1883	♂ ad..	273	21	129	32	13	28	34
92988	2225	......do	July 3, 1883	♀ ad..	260	22	130	36	12.5	27	29
89142	1470	......do...............	July —, 1882	(♂) ad.	......	......	......	......	......	......	......

No. 92985.—Iris blackish brown. Bill light grayish white with a faint bluish tinge, darker grayish at base; culmen and tip of gonys blackish; interior of mouth, faint bluish white. Feet light grayish white with a tinge of violet blue; outer aspect of tarsus more bluish; joints and webs dark bluish gray; tarsus and toes underneath blackish. Testes very small. Stomach contained Gammarids. (Colors noted within the first thirty minutes after the bird was killed; they changed materially—to a bluish crimson on the bill—not many hours after).

No. 92986.—Iris dark brown. Bill whitish with a light tinge of violet gray; culmen, except the extreme tip and base of both mandibles, blackish brown. Feet similarly colored; joints darker violet gray; webs and underside blackish.

When I got the specimen in winter plumage I had also at hand fresh specimens of *Simorhynchus pygmæus* and *pusillus*. The similarity in the bill struck me, and I thought it desirable to institute a comparison while the birds were still in the flesh. The following remarks are an abstract of the original notes:

With the exception of the brownish, almost blackish, iris, and the scutellation in front of the tarsus, the *Synthliboramphus* seems to be nearer related to the *Phalerideæ* than to the *Uriinæ*. The nostrils are essentially as in the former group, particularly *S. pygmæus* and *pusillus*, anteriorly forming an acute angle while rounded behind; but being a little shorter they present a somewhat triangular or rather pear-shaped form; they are situated a little higher, and the feathering of the face is extending a trifle farther towards the hind margin of the nostrils *without reaching them*, however; on the culmen the feathering goes further forward, surpassing the posterior border of the nostrils, but so it does in *S. pygmæus* also; the feathering of the mental angle advances far in front of that on the upper mandible; the nostrils are roofed over by a prominent nasal shield with a distinctly raised edge, quite similar to that of *S. pygmæus*, and, like those of the latter, *they are pervious;* a further similarity is the *soft and naked cere* at the base of culmen, which is rather *larger than* in *S. pygmæus*. The perfect similarity in the structure of these parts makes it extremely probable that they are periodically shed as in the *Phalerideæ*. In a fresh specimen of *Uria californica* I find the nostrils situated near the tomia, linear and not roofed by a prominent scale with raised lower margin; *no soft cere is visible*, and the loral feathering fills the nasal groove considerably beyond the anterior angle of the nostrils, while on the culmen it recedes as far as the posterior margin of the nostrils, the culmen thus forming an acute angle into the feathering of the forehead; the feathering of the mental angle does not go beyond that of the nasal grooves.

10. Simorhynchus pygmæus (GMEL.)

1788.—*Alca pygmæa* GMEL., Syst. Nat., I, p. 555.—*Phaleris p.* STEPH. Gen. Zool., XIII, pt. i, p. 48 (1825).—*Simorhynchus p.* BRANDT, Mélanges Biol., VII, 1869, p. 228.—NELSON, Cruise Corwin, p. 116 (1883).—STEJNEGER, Naturen, 1884, pp. 35, 55.—TURNER, Auk, 1885, p. 159.

1801.—*Alca kamtschatica* LEPECHIN, Nov. Act. Petropol., XII, 1801 (p. 369, tab. 8).—*Simorhynchus c.* SCHLEGEL, Mus. P. B. Urinat., p. 25 (1867).—BRANDT, Mélanges Biol., VII, 1869, p. 227.—FINSCH, Abh. Brem. Ver., III, 1872, p. 81.—TACZAN., Orn. Faun. Vost. Sibir., p. 74 (1877). —*Id.*, Bull. Soc. Zool. France, 1877, p. 52.—DYBOWSKI, Sitzb. Dorpat. Naturf. Ges., 1881, p. —.—*Id.*, Orn. Centralbl., 1882, p. 41.—*Id.*, Bull. Soc. Zool. France, 1883, p. 349.—*Phaleris c.* BLAKIST., Amend. List B. Jap., p. 31 (1884).

1822.—*Mormon cristatellus* CUVIER, in Choris' Voy. Pittor., Aléout., p. 18, pl. xii (*nec* PALLAS).—*Phaleris c.* TEMM., Pl. Color., V, pl. 200 (1824).

1823.—*Mormon superciliosa* LICHTENST., Doublettenverz., p. 89.

1826.—*Uria mystacea* PALL., Zoogr. Ross. As., II, p. 372.—*Phaleris m.* CASSIN, Perry's Exped. Jap., II, p. 234 (1857).—SWINH., P. Z. S., 1863, p. 331.—BLAKIST. & PRYER, Ibis, 1878, p. 210 (*part*).—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 179.—*Iid.*, *ibid.* X, 1882, p. 89.—SEEB., Ibis, 1879, p. 21.

1826.—*Uria crinita* PALL., Zoogr. Ross. As., I, p. 301, (*nom. nudum*).

1826.—*Phaleris cristella* BOIE, Isis, 1826, p. 980 (*err. typ.*).

1868.—*Simorhynchus cassini* COUES, Pr. Phil. Acad., 1868, p. 45.—BRANDT, Mél. Biol., VII, 1869, p. 235.—DALL & BANNIST., Tr. Chic. Acad., I, 1869, p. 309.—BAIRD, Tr. Chic. Acad., I, 1869 (p. 324), pl. xxxi, fig. 2.

My studies of the moulting of the plumage are based upon twenty-three specimens collected by me, consisting of birds in all ages and nearly at all seasons, probably the largest material of this rare bird at the command of any ornithologist, and were made on the fresh birds before and during skinning, so that the results may be regarded as conclusive upon several points. They may be summed up briefly as under.

When the young leaves the egg, in the latter part of June, it is covered by a dense down, dark fuliginous above, lighter and more grayish on the abdomen. Such a specimen, No. 92977, only a few days old, was obtained, together with its father, No. 92973, both taken on the nest, on June 28, 1883. Another downy young (No. 92976) was collected July 12; it is half-fledged, the new plumage, on the whole, like that of the adults, being only a little lighter underneath, nearly pure white on the abdomen, but, before long, this light, or rather pure, color darkens, as in the young of *Lunda cirrhata*, and a young (No. 92974) killed only six days later, but fully fledged and without any trace of down left, is undistinguishable from the old ones as far as the general coloration of the plumage is concerned; the loral tuft, with its malar and superciliary branches, and the postocular stripe are indicated by light grayish feathers. The young bird I shot at Dikij Mys, Bering Island, on August 22, 1882, is identical with the last one, both being perfect counterparts of the type of Dr. Coues's *Simorhynchus cassini*. If any doubt should still linger concerning the identity of the latter with *S. pygmæus*, an inspection of my series will remove it from the most skeptical mind.

In this plumage the young remain until about the end of December, for No. 92962, shot on the 3d of January, is nearly identical with the last-mentioned young bird, with the exception of the bill, which is more vividly colored, and the general aspect of the plumage, which seems fresher and of a more slate-colored hue, owing to the fact that the feathers are new, many being still in their sheaths. But on the same date I obtained five other specimens which show all the intermediate grades between this and the fully developed plumage with the long and rich crests, as exhibited by No. 92960, which was shot five days previous, and by No. 92961, collected on the 30th of December. The wing feathers are yet in pretty good condition, and are not moulted now. Alongside with the development of the new contour-feathers and the ornamental plumes goes the increasing intensity and purity of the colors of the bill, the nasal shield of which, however, is still dusky. During the following months the bill assumes still more vivid colors, the tip becomes nearly pure white, the middle scarlet, and the nasal shield finally, when the birds, just before the breeding season, appear at the rookeries, turns into a fine carmine, as shown by No. 92972 (Pl. IV, Fig. 2), a female shot May 6, 1883. But while in this specimen the bill shows its highest perfection, the plumage already bears evidence to the commencing decay caused by the wear of the feathers while inhabiting the deep nest-holes in the crevices of the rocks, and the abrasion is particularly visible on the wing-coverts, which were not shed when the other feathers of the body were moulted, viz, late in winter, the middle row being light brownish gray, as are also the exposed parts of the inner primaries. Also the ornamental plumes are on the decline, and the frontal crest is already thinned out considerably, consisting in the specimen in question of only four plumes, while some birds in "full dress" may be found having as many as a dozen. During the incubation the plumage becomes gradually more dilapidated, and when the young are out, the parents—at other seasons so graceful and beautiful—present a rather miserable aspect, the white plumes on the head being soiled and glued together, and all the wing-feathers faded into a dirty gray, with the vanes disconnected and the edges ragged. All the birds taken on the nest, July 21, were in that deplorable condition, only that the wings were spotted with slaty black as the new coverts made their appearance now, the middle row being complete already. Also the four or five inner primaries were shed, and the new ones, in different stages of development—the three innermost full grown—contrasted favorably against the faded-out remnants of the old ones. The tail-feathers are still unshed, but their condition plainly shows that they will be moulted before long. The ornamental feathers are worn down, the crests are thin, and many of the long plumes have already disappeared. These specimens prove beyond a possibility of doubt that the remiges and rectrices are moulted towards the end of the breeding season, and that the process commences with the inner primaries*. But not only are the wing-feathers shed now, but also the contour-feathers; all over the body protrude now the bluish sheaths containing the new feathers, which in some places have already burst through the tips. The post-nuptial moult, therefore, is a complete one.

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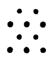
*That the process is similar in the allied *Ptychoramphus aleuticus* (PALL.) is evident from a specimen (U. S. Nat. Mus. No. 100070) collected by Mr. Charles H. Townsend at the Farallon Islands on September 11, 1884. It has just moulted all the primaries which are full grown, except the first one, which is still partly in the sheath.

At this time the brightness of the bill has likewise faded away, the white tip gets bluish, and the basal parts darken. The upper layers of the horny covering scale off, but I feel satisfied that a regular shedding of the basal parts, such as in the *Fraterculeæ* does not take place. In order to sustain this opinion I quote from my original notes taken down when examining four fresh birds on Copper Island, July 21, 1883: "The nasal shield is blackish brown, but of a peculiar appearance, as if veiled by a thin translucent crust. This was easily removed with the knife, and when detatched presented a very thin and translucent piece of oval shape, but with lacerated edges. In the same manner the small space between the two ridges behind the nostrils was easily deprived of a similar crust. In two specimens the covering of the terminal part of the bill is scaling off in a similar manner, bursting irregularly near the border of the basal part, and along both sides of the culmen, and the same process seems to begin on the lower jaw also. *The layer underneath is not perceptibly softer.*" It should be remarked that the basal parts were hard, as they were in all the specimens collected in December and January, and also in the young birds. The reverse was the case in specimens of *Lunda cirrhata* and *Fratercula corniculata* of corresponding date and age.

It remains now to point out and correct some minor errors of my predecessors, particularly Messrs. Dr. Dybowski and L. Bureau. As to the latter's statement (B. S. Z. F., 1879, p. 63), "En hiver, ces lamelles [la cuirasse nasale] se détachent sans doute, et laissent a découvert une simple membrane nasale," it may suffice to refer to my remarks above. In reference to the descriptions given by the former (Orn. Centrbl., 1882, p. 41), it is at once apparent that the colors of the bill and feet are taken from the dried specimens, consequently being quite erroneous. The bill is not "dark violet towards the tip and the tip itself whitish violet" in the fresh or living bird, but turns so after the lapse of some time; nor are the feet "reddish or yellowish ashy gray," but light bluish gray!

His description of the different crests and ornamental feathers are not quite correct, as will be seen by comparing them with my figure (Pl. IV, Fig. 2), which was drawn and colored from the fresh bird, *before skinned*, and with Dr. Dybowski's descriptions lying before me. It is particularly the note, designated by him as D, 4, a, which is inaccurate. Furthermore, he asserts in a very general way, that the white ornamental feathers on the side of the head stand out like crests in the living bird.* I do not know what facilities he had for observing the living birds, but I can affirm that on five living birds which I possessed for several days, neither the anteocular nor the subauricular plumes were ever raised, nor did I observe it in any of the many birds I had the good fortune to observe in the free state. That these ornaments may occasionally be raised is not improbable, but it is not the general manner in which they are carried.

But the most curious blunder of Dr. Dybowski in connection with this species is the assertion that all the plumes forming the curious curved black crest on the forehead originate from a single common shaft: "Alle 12 Federchen haben eine gemeinsame Federspule"! Any one familiar with the structure of birds' feathers will at once suspect this wonderful discovery, and consequently I investigated the case very thoroughly; in fact, I dissected the crest out of No. 2334 (U. S. Nat. Mus. No. 102224), which was obtained at Copper Island on July 21, 1883, and the preparation is now in the United States National Museum. This shows, as might be expected, quite a different state of affairs, each plume having, as a matter of course, its own separate shafts, springing from individual follicles, and being in no way connected with its neighbor, as the roots are inserted about 0.3^{mm} apart from each other. The specimen in question possesses seven plumes, which are arranged thus: First come three plumes alongside each other; just behind the intervals between them are two feathers, forming the second row; next come two feathers, a third one having dropped out, if I am not mistaken; in front of the first row are two empty follicles, the plumes of which must have dropped out only recently; ten plumes can thus be traced, and are situated in the following order: 2-3-2-3, thus:



They are consequently arranged in "quincunx," or, in other words, in the same manner as all the other feathers. The "plumes" are only extremely lengthened, but otherwise they are normal contour-feathers!

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* "Alle diese drei Federzüge stehen beim lebenden Vogel schopfartig vom Körper ab." (*l. c.*).

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92960	1823	Bering Island	Dec. 29, 1882	♂ ad.	185	11	105	33	10	22	30
92961	1829	....do...............	Dec. 30, 1882	♂ ad.	181	3	109	31	10	21	30
92962	1837	....do...............	Jan. 3, 1883	♂ ad.	195	......	106	30	10	22	31
92966	1841	... do...............	Jan. 3, 1883	♂ ad.	190	......	113	31	10	22	31
92967	1842	....do...............	Jan. 3, 1883	♂ ad.	195	......	108	30	10	22	31
92964	1839	....do...............	Jan. 3, 1883	♂ ad.	195	......	114	35	10	22	32
92968	1854	....do...............	Jan. 5, 1883	♂ ad.	192	......	112	35	10	22	31
92969	1866	....do...............	Jan. 9, 1883	♂ ad.	191	......	105	33	10	22	32
92970	1871	....do...............	Jan. 16, 1883	♂ ad.	193	0	108	33	10	21	32
92973	2203	Copper Island....	June 28, 1883	♂ ad.	207	17	113	33	10	22	31
89140	1475	....do...............	July, 1882	(♂)ad.	......	......	110	30	......	23	31
89139	1474	...do...............	July, 1882	(♂)ad.	......	......	107	27	9	22	30
89141	1476	....do...............	July, 1882	(♂)ad.	......	......	......	......	......	......	......
92959	1808	Bering Island	Dec. 14, 1882	♀ ad.	188	0	104	29	9	22	30
92963	1838	....do...............	Jan. 3, 1883	♀ ad.	184	......	105	30	10	22	32
92965	1840	....do...............	Jan. 3, 1883	♀ ad.	192	......	106	30	10	22	......
92971	1894	....do...............	Jan. 30, 1883	♀ ad.	203	......	110	31	10	22	31
92972	2014	....do...............	May 6, 1883	♀ ad.	211	......	110	31	10	23	33
92975	2285	Copper Island.....	July 21, 1883	♀ ad.	......	......	105	27	10	22	......
102224*	2334	...do...............	July 21, 1883	ad.	......	......	......	......	......	......	.....
92974	2266	....do...............	July 18, 1883	♂ juv.	195	9	105	30	10	23	33
89099	1486	Bering Island.....	Aug. 22, 1882	juv.	180	......	107	31	10	21	32
92976	2235	Copper Island.....	July 12, 1883	♀ pull.	171	......	68	......	9	21	27
92977	2202	....do...............	June 28, 1883	♂ pull.	128	......	......	......	7	17	22

* Preserved in alcohol.

No. 92960.—Iris white. Bill, milky white at tip and at base of lower mandible; rest of the bill, including culmen, upper tomia, and a median cross-band on lower mandible, vivid blood-red; nasal cuirass and a small portion in front of nostrils, as well as the soft cere at base, blackish brown. Feet light bluish gray, with the joints somewhat brownish violet, the tinge of the blue being different from that of *S. pusillus* (L. S., No. 1818), mixed as it is with "neutral tint;" soles and webs blackish. Contents of crop and stomach Gammarids. Colored drawing (pl. iv, fig. 1) prepared immediately.

No. 92961.—Iris white. Testes somewhat swollen; crop and stomach contained Gammarids.

No. 92962.—Iris white. Bill, blackish brown on nasal cuirass, and a little in front of nostrils, then dull red, and at tip horny, brownish white. Feet, light bluish gray, with a faint violet tinge. Testes, small, not swollen. Lean; crop contained Amphipods.

No. 92966.—Iris white. Testes, small, not swollen. Fat. Crop contained small Amphipods.

No. 92964.—As foregoing, but feet a trifle more bluish. Not fat. Amphipods.

No. 92968.—Iris white. Bill somewhat pale, the red portion being hardly deeper colored than reddish flesh-color. Feet a little more bluish than usual. Testes small, not swollen.

No. 92959.—Iris white, with a faint, yellowish tinge. Bill dull blood-red, with the base of culmen, the nasal cuirass, and a small portion in front of the nostrils blackish brown; base of upper tomia pale brownish gray; tip of upper mandible dark brownish gray; lower mandible somewhat paler, almost flesh-colored at base, and behind the brownish tip. Feet, light bluish gray, with a faint brownish tinge on the joints; soles, nails, and webs, blackish; interior of mouth white, with a light flesh-colored tinge; stomach empty, with the exception of the shell of a small Gastropod and three horny hooks of a Decapod.

No. 92971.—Stomach and crop filled with Gammarids.

No. 92972.—Iris white. Bill vivid scarlet, the nasal cuirass tinged with carmine, the rest slightly mixed with orange; edges and angles of nasal cuirass with blackish marks; tip of both mandibles and a narrow space round the base of the lower one milky white, with a faint shade of blue, strongly contrasting with the red; feet bluish gray, tinged with violet; joints, darker gray; webs and soles blackish. Eggs in ovarium swollen, the largest one $4\frac{1}{2}^{\mathrm{mm}}$ in diameter. Stomach and crop, empty. Lean. New feathers protruding, especially on belly, neck, and head.

No. 92974.—Iris, inner ring, bluish gray, narrow; outer one, faint bluish white; when alive the pupil was contracted and very small. Bill, blackish brown, underneath the nostrils lighter grayish, as is also the lower mandible; feet, light bluish gray; joints, brownish; webs, dark gray; soles, blackish; colors from the *living* bird. Testes, very small and undeveloped. Bones, well ossified. Most feathers yet in their sheaths Not fat

No. 89099.—Iris white, with a faint yellowish tinge. Bill, reddish black, lighter at base. Feet, violet. bluish in front, reddish on sides, black behind and below, as are also the webs. Interior of mouth whitish.

No. 92976.—Iris, inner ring, narrow, bluish gray; outer one, light bluish white. Bill dark brownish gray: upper mandible almost blackish; a faint violet tinge below the nostrils, and on the lower mandible towards the base. Feet, gray, strongly tinged with violet; joints darker brownish; webs dark gray, below, blackish. Extremely fat.

No. 92977.—Iris clear gray with a faint bluish tinge. Bill blackish gray; culmen and middle portion of lower mandible lighter, somewhat violet-gray; nasal cuirass and angle of mouth, blackish, as is also the naked eye ring. Feet light gray, with a violet bluish tinge; joints darker gray; claws light, horny gray, with blackish tips; tarsus and toes underneath, blackish gray. Testes, recognizable. Crop, filled with Gammarids; very fat.

This little Auk, certainly the prettiest species of the whole family, has apparently the center of its distribution on the islands visited by me. On Bering Island it is rather rare, however, though it breeds in the crevices of the outlying islet Arij Kamen, in a precipice near the fishing-place Saranna, and probably in several places on the southern part of the island, for instance, at Dikij Mys. Copper Island, with its steep rocky shores, is the favorite home of this bird, however. It may be found breeding all around the coast where suitable holes and crevices occur. I know of nesting places near the main village, at Karabelnij, and on Tschornij Mys. At the latter place it occupied holes in the basaltic cliff along side those of *Oceanodroma furcata*, the latter inhabiting the deeper ones. It could be told at once by the peculiar smell emanating from the caverns of the latter bird, which species was to be found inside.

Notwithstanding the fact that the birds are rather common, it must be considered good luck to meet them and get opportunity of observing them, for they are rather shy and live quite retired in their deep holes.

They are early breeders, in that respect being considerably ahead of their allies, for instance, *Lunda cirrhata;* so early, in fact, that no eggs could be procured in the latter part of June, when I had the opportunity to go in search of them. The nests at that time already contained young ones. These remain in the nest until full fledged. A specimen having left the nest only a few days previous, was taken alive on board the steamer when at anchor at Glinka, Copper Island, July 18. This bird was found early in the morning, concealed in a fold of one of the sails, the inexperienced youth having probably mistaken it for the crevice of a rock. This would indicate that they pass the nights in holes as long as they stay near land.

When the breeding season is over, they, like all the allied forms, retire to the open ocean, part of them at least, going to more southerly latitudes to winter. That many stay in the neighborhood of the islands is evident from the fact that I obtained numerous specimens at Bering Island in December and January. A single female came near the coast on December 14, 1882, and was shot; but from the 29th of the same month until January 5, 1883, a few could be met with every day. They could then be seen in small societies of two to four, swimming along the rocky shores, alternately diving for food, which chiefly consisted of Gammarids. When diving they raised themselves a little on the water, and then made a sudden jump downward. The weather was not stormy, but we had during that week a very cold spell. Later in January they became scarce, but a few specimens were secured, the last one on January 30. They appeared again at their breeding places during the first days of May.

Owing to the comparative scarcity of this species at Bering Island, the natives there are not so familiar with it as are the Copper Islanders, and have therefore no peculiar name for it, calling it sometimes the "Malinka Konjuga" (small *S. cristatellus*), or using the more general and indefinite term "Petuschka." The inhabitants of Copper Island have no Russian name for it either, but it is well known to them under the Aleutian name "Turuturk" (pronounce: Too roo-toork).

11. Simorhynchus cristatellus (PALL.)

1769.—*Alca cristatella* PALLAS, Spicil. Zool., V, p. 18, pl. iii, et pl. v, figs. 7, 8, 9.—*Uria c.* PALL., Zoogr. Ross. As. II, p. 370 (1826).—*Phaleris c.* SCHRENCK, Reis. Amurl. I., p. 500, tab. xvi, figs. 4 and 5 (1860).—COINDE, Rev. Mag. Zool., 1860, p. 402.—SWINH., P. Z. S., 1863, p. 330.—WHITELY, Ibis, 1867, p. 209.—DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 309.—DALL, Avif. Aleut. Isl. Unal. eastw., p. 11 (1873).—*Id.*, Avif. Aleut. Isl. west Unal., p. 11 (1874).—SEEB., Ibis 1879, p. 21.—BLAKIST. & PRYER, Tr. As. Soc. Jap., VIII, 1880, p. 179.—*Iid.*, *ibid.* X, 1882, p. 89.—PALMÉN, Swed. Cat. Lond. Fish. Exh., p. 201 (1883).—BLAKIST., Amend. List B. Jap., p. 31 (1884).—*Simorhynchus c.* SCHLEG., Mus. P. B. Urin., p. 25 (1867).—BRANDT, Mel. Biol., VII, 1869, p. 223.—FINSCH, Abh. Brem. Ver., III, 1872., p. 81.—COUES, in Elliott's Aff. Alaska, p. 206 (1875).—TACZAN., Orn. Faun. Vost. Sibir., p. 74 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 51.—*Id.*, *ibid.*, 1882, p. 398.—DYBOWSKI, Sitzb. Dorpat. Naturf. Ges., 1881, p. —. —*Id.* Orn. Centralbl., 1882, p. 28.—*Id.*, Bull. Soc. Zool. France, 1883, p. 349.—ELLIOTT, Monogr. Seal Isl., p. 134 (1882).—SEEB., Ibis, 1882, p. 368.—BEAN, Pr. U. S. Nat. Mus., 1882, p. 171.—NELSON, Cruise Corwin, p. 116 (1883).—TURNER, Auk, 1885, p. 159.—*Tylorhamphus c.* TACZAN., J. f. Orn., 1876, p. 203.

1769.—*Alca tetracula* Pall. Spicil. Zool. V, p. 23, pl. iv, et. pl. v, figs. 10, 11, 12.—Kittl., Denkw., II, p. 214 (1858).—*Uria t.* Pall., Zoogr. Ross. As., II, p. 371.—*Phaleris t.* Middend., Sibir. Reis., II, 2 (p. 239) (1853).—Swinh., P. Z. S., 1863, p. 331.—Dall & Bannist., Tr. Chicag. Acad., I, 1869, p. 309.—Taczan., Orn. Faun. Vost. Sibir., p. 74 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 52.

1776.—*Alca cristata* Müll., Syst. Nat. Suppl., p. 104.

1826.—*Uria dubia* Pall., Zoogr. Ross. As., II, p. 371.—*Alca d.* Kittl. Denkw., I, p. 300 (1858).

1839.—*Phaleris superciliata* Audub., Orn. Biogr., IV (pl. 402).

1878.—*Phaleris mystacea* Blakist. & Pryer, Ibis, 1878, p. 210 (*part*).—Seeb., Ibis, 1879, p. 21.

The changes of plumage of this species are identical with those of *Simorhynchus pygmæus*, and as the latter have been described with considerable detail, I shall content myself by referring to my remarks under the heading of that species.

I may, however, call attention to a feature of the nuptial plumage of the present species, which has not been noticed by previous authors, so far as I am aware. I refer to the numerous and exceedingly fine hair-like white plumes which are interspersed with the others on the crown and nape. They are particularly noticeable and numerous on a ♀, shot May 16 (No. 89096). In a ♂, collected June 4 (No. 92955), they are greatly reduced, and in all probability they are only present during a very short period.

During the breeding season the bill of this species differs greatly from that of *S. pygmæus*, though in winter they are very much alike. The sides of the mandible, of the maxilla, and the nasal cuirass are swollen, and the different pieces separated by deep grooves, and at the base of the maxillar tomium is developed a more or less irregularly rounded horny and hard piece, which has a superficial resemblance to the "rosette" of the genera *Lunda* and *Fratercula*, without in any way being homologous with the latter structure. The "rosette" is more or less soft, being a kind of wattle lining the angle of the mouth all round, both above and beneath; the tomial plate of *S. cristatellus* is hard, horny, and is only affixed to the upper edge of the basal part of the tomium. It is only fixed to the edge of the commissure along its lower border, the upper half being entirely free and concealing the feathers behind it. These different basal pieces are evidently regularly shed, as in the *Fraterculeæ*, and at the same time. Of all the rich material at my disposal, no specimen was taken during the more advanced stage of this shedding, so it is impossible to say just how many pieces fall off separately. So much is certain, however, that the above-mentioned circular corner-piece is shed first, and comparatively early, several specimens affording evidence that it drops off before the birds leave the rookeries. The material at hand also indicates that the outgrowth in spring and the change of color of the basal parts of the bill takes place rather late and very rapidly, much more so than the corresponding process in *Lunda* and *Fratercula*.

As to the condition of the bill and the basal part of the upper tomium in winter, I refer to fig. 5, on plate iv, and to the following description of these parts which I took down from the fresh specimen (No. 92952) as follows: "The feathering at the base of the maxilla does not (as in *S. pygmæa* and *pusilla*) cover the tomium, which is soft and forms a whitish, broadened lobe above the corner of the mouth." No corresponding structure was observed in the other species. This soft lobe, the "matrix" of the horny circular corner-piece, is hardly noticeable in the dried skins.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail feathers.	Culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89097	1058	Bering Island	May 16, 1882	♂ad.	240	......	134	39	11	27	37
92955	2122	.. do................	June 4, 1883	♂ad.	260	9	134	40	12	28	39
92954	2130	...do	June 4, 1883	♂ad.	273	11	134	38	13	29	....
89096	1057	....do................	May 16, 1882	♀ad.	249	......	138	37	11	29	40
92956	2093	...do................	May 19, 1883	(♀)ad.	(235)	......	133	40	12	29	38
92957	2172	...do................	June 14, 1883	♀ad.	266	15	134	36	12	28	38
92952	1765	...do................	Dec. 2, 1882	♀	247	......	125	33	11	28	39
92951	1832	.. do................	Jan. 1, 1883	♀	265	23	126	35	11	27	39
92953	1875	...do................	Jan. 18, 1883	♀	254	......	133	35	11	26	37
92958	1932	...do.......	Mar. 1, 1883	♀ad.	270	......	135	35	11	29	39

No. 89097.—Iris white. Bill reddish orange; tip horny white, shaded with dusky, on upper mandible. Feet light violet gray; joints darker; webs blackish; tarsus and toes below black; nails gray at base, blackish at tip.

No. 92955.—Iris white. Bill bright reddish orange; tip horny brownish white. Feet light violet gray; joints darker. Crop and stomach empty.

No. 92954.—Iris white. Color of bill and feet as foregoing number, only that the feet have a more pure bluish hue. Stomach empty. Very fat.

No. 89096.—Iris white. Bill reddish orange; tip brownish gray; tip of lower mandible somewhat lighter; interior of mouth white, with a slight tinge of flesh color. Feet light violet gray; joints darker; web, soles, and nails black.

No. 92952.—Iris white. Bill horny brown; both mandibles at base and the gonys lighter; soft edge at base of upper mandible whitish; interior of mouth white, faintly tinged with flesh color. Feet violet pearly gray: joints brown; webs and soles dark brownish. Stomach empty.

No. 92951.—Iris white. Bill horny brown; tip of upper mandible more grayish; lower mandible lighter, almost brownish flesh color. Feet bluish gray, a trifle darker and more violet than in *Simorhynchus pygmæus*; joints brownish; webs and soles blackish.. Extremely lean.

No. 92953.—Iris white. Bill brownish gray. Feet light bluish gray. Found dead on beach. Œsophagus, crop, stomach, and intestines filled with a semifluid violet red matter, which I take to be the remains of a cephalopod. Tolerably fat.

No. 92968.—Iris white. Bill, see colored drawing taken immediately from the fresh bird (tab. iv, fig. 5). Feet bluish gray; joints violet brown; webs and soles blackish. Some of the eggs in the ovary had commenced swelling. New feathers in their sheaths on upper head and neck.

The present species is a regular breeding bird of both islands, without being very plentiful, however, and seems to be rather scarce on Copper Island, where *S. pygmæus* is more common than the "Konjuga," a name by which *cristatellus* is known on Bering Island.

Like most of the members of the family, many winter on the ocean, not very distant from the islands, as it was among the species which I picked up on the beach after severe gales.

12. Simorhynchus pusillus (PALL.)

1826.—*Uria pusilla* PALLAS, Zoogr. Ross. As., II, p. 373.—*Phaleris p.* COINDE, Rev. Mag. Zool., 1860, p. 403.—CASSIN, Pr. Philada. Acad., 1862, p. 324.—DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 309.—BLAKIST. & PRYER, Tr. As. Soc. Jap., VIII, 1880, p. 179.—*Iid.*, *ibid.*, X, 1882, p. 89.—BLAKIST., Amend. List B. Jap., p. 31 (1884).—*Simorhynchus p.* FINSCH, Abh. Brem. Ver. III, 1872, p. 81.—COUES, in Elliott's Aff. Alaska, p. 208 (1875).—ELLIOTT, Monogr. Seal Isl., p. 134 (1882).—TURNER, Auk, 1885, p. 159.—*Ciceronia p.* TACZAN., J. f. Orn., 1876, p. 203.—*Id.*, Orn. Faun. Vost. Sibir., p. 74 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 51.—DYBOWSKI, Sitzb. Dorpat. Naturf. Ges., 1881, p. —. —*Id.*, Orn. Centralbl., 1882, p. 28.—*Id.*, Bull. Soc. Zool. France, 1883, p. 350.—NELSON, Cruise Corwin, p. 116 (1883).

1831.—*Phaleris corniculata* ESCHSCHOLTZ, Zool. Atlas, IV (tab. 16).

1837.—*Phaleris pygmæa* BRANDT, Bull. Scientif., II, 1837, p. 347 (*nec* GMEL., 1788).—*Simorhynchus p.* SCHLEGEL, Mus. P. B. Urinat., p. 23 (1867).—SEEB., Ibis, 1884, p. 31.

1837.—*Phaleris microceros* BRANDT, Bull. Scientif. II, 1837, p. 347.—DALL & BANNIST., Tr. Chic. Acad., I, 1869, p. 309.—*Ciceronia m.* PALMÉN, Swed. Cat. Lond. Fish. Exh., p. 201 (1883).—SAUNDERS, Ibis, 1883, p. 348.

1838.—*Phaleris nodirostra* BONAP., Comp. List, p. 66.

1839.—*Cerorhinca occidentalis?* VIGORS, Zool. Voy. Blossom, Orn., p. 33 (*nec* BONAP.).

1878.—*Mergulus* sp. inc., BLAKIST. & PRYER, Ibis, 1878, p. 210.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex.	Total length.	Tail beyond wings.	Wing.	Tail feathers.	Culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92979	1818	Bering Island	Dec. 29, 1882	♂	170	......	92	29	9	18	26
92981	1826	....do	Dec. 29, 1882	♂	184	......	93	34	9	20	27
92980	1825	....do	Dec. 30, 1882	♂	175	3	94	32	9	20	28
92983	1835	....do	Jan. 3, 1883	♂	168	......	96	28	9	19	28
92978	1763	.. do	Dec. 1, 1882	♀	173	......	92	31	9	20	27
92982	1827	....do	Dec. 29, 1882	♀	169	0	91	27	9	21	27
92984	1836	....do	Jan. 3, 1883	♀	172	......	91	28	9	19	....

No. 92979.—Iris white. Bill horny brown; gonys and tomia somewhat lighter; extreme tip of lower mandible whitish. Feet light whitish cobalt blue; joints darker, a little purplish; soles and webs blackish. Crop contained several small Gammaridæ; in the stomach remains of a larger one.

No. 92981.—Iris white. Bill horny brown; tip whitish; gonys reddish flesh color. Feet light bluish gray; joints marked with brownish violet; soles and webs blackish. Testes large and swollen. Stomach and crop empty.

No. 92980.—Iris white, with a faint rosy tinge. Bill horny blackish brown: under mandible lighter; tip whitish. Feet light grayish blue, with a faint yellowish tinge, except on the joints, which are darker and marked with purplish blue; soles and webs blackish. Testes small, not swollen. Stomach and crop contained Gammaridæ and Palæmonidæ.

No. 92983.—Iris white. Bill horny black; extreme tip of lower mandible whitish. Feet light grayish blue; darker blue on the joints; webs and soles blackish. Testes small, not swollen. Several new feathers in their sheaths on the back. Crop crammed with small Palæmonidæ. Lean.

No. 92978.—Iris white, with a faint rosy tinge. Bill horny black; gonys and base of lower mandible light flesh color; interior of mouth whitish. Feet light grayish blue; joints somewhat brownish; webs and soles black. Stomach empty.

No. 92984.—Iris white. Crop contained Amphipods.

In addition to the above notes on the color of the naked parts, contents of stomach, &c., a series of remarks were taken down from the fresh birds in order to show the relative proportions of different parts and other points which might be of interest as showing features not observable in the dried skins. The original notes read as follows:

No. 92978.—Membrane covering the nasal groove soft, except the prominent ridge forming the hind and upper border of the nostrils. The cere covering the culmen between the nostrils entirely soft, and of the color of the bill. No knob.

No. 92979. When the legs are stretched backwards the distal end of the first phalanx of the middle toe reaches tip of tail; tip of folded wings reach a little beyond the digito-tarsal joint. Middle toe without claw decidedly longer than the outer one; end of inner toe reaches penultimate phalanx of the middle toe. Feathering on mental angle reaches as far as the fore border of the nostrils. No knob.

No. 92981.—Proportions similar to those of the foregoing number, only that the wings hardly reach beyond the tarsal joint. On the bill the cere is raised a little on the culmen, on which several longitudinal furrows are visible, indicating the beginning of the knob.

No. 92982.—Tips of closed wings and end of tail reach middle of basal phalanx of middle toe, legs being stretched backwards. Middle toe decidedly longer than outer one. Knob very small, but fairly perceptible.

No. 92980.—Tip of tail reaches first joint of middle toe; the latter without claw longer than the outer toe. At base of culmen a compressed knob, 1.5^{mm} long, 0.5^{mm} broad, and 1^{mm} high, highest behind. The upper surface of the knob is furrowed lengthwise, as if the knob were composed of four or five vertical leaves or layers. This is the original of the drawings.

Almost every one of the specimens had some injuries to their feet, phalanges wanting, webs split, &c. No. 92984 had even the whole left foot amputated, just beneath the heel, and the wound completely healed, and No. 92980 had the bone of the right tibia in the middle grown out to a big knot many times as thick as the bone in its normal condition.

All the specimens were lean, several of them even extremely so.

The plumage is still the so-called winter plumage; that is, the lower surface is still pure white, except in one skin (No. 92981), in which a few feathers on the abdomen are edged with dusky, as in summer specimens. But the white ornamental plumes of the face are present in all stages of development, from mere white specks until fully grown out, as in the head figured. The sequence of the following numbers indicates the gradual increase of the number and size of these plumes: 92979, 92984, 92983, 92982, 92981, 92978, 92980.

Considering that most of the above specimens were obtained during the week between Christmas and New Year, the following conclusions seem to be justified:

The Least Auk, after the breeding season is over, probably at the same time as the corresponding process takes place in the allied species, loses the peculiar knob at the base of the culmen together with the lengthened and pointed white plumes ornamenting its face and head. About the end of the year, in some individuals earlier, in others later, a new knob and new ornamental feathers grow out, and, shortly after, the moult of the feathers of the body commences. The color of the bill also begins to change at the same time.

Dr. Dybowski asserts that he has found *Ciceronia pusilla* "nesting" at the Commander Islands ("nistend," Orn. Centrbl., 1882, p. 28). He gives no particulars, however, and during my subsequent sojourn on the island I could learn nothing about it. One thing is sure, that he got no eggs from there, and I doubt very much that the species has ever been found "nesting" on the islands. The birds are unknown to the inhabitants, at least to those of Bering Island, which I learned by showing them my winter specimen. Nor have they any vernacular name for the bird. In all probability Dr. Dybowski has been misinformed about the date of his specimen, which, curiously enough, is not mentioned by Taczanowski in his lists of the birds from Kamtschatka.

It was on December 1, 1882, that a specimen was brought me from Ladiginsk, on Bering Island. It was in full winter plumage, entirely white beneath, without knob, and with only a few traces of white feathers on the face. A few days before the end of the year several birds came near the shore, where they now could be seen to swim in small troops, or more frequently by twos and threes, parallel to the coast about a hundred yards off shore, according to the depth, usually in three-fathom water, where they dived with great expertness for Amphipods, which at that time seemed to be their chief or only food. When diving they lifted themselves up a little, and went down with a quick jump.

We were having a severe spell of cold when they made their appearance, and when it was over they disappeared again, none being seen after the 5th of January. They evidently winter on the open ocean somewhere about the islands.

13. Cyclorrhynchus psittaculus (PALL.)

1769.—*Alca psittacula* PALLAS, Spicil. Zool., V (p. 13, pl. ii et pl. v, figg. 4, 5, 6).—*Lunda ps.* PALL., Zoogr. Ross. As., II, p. 366.—*Ombria ps.* ESCHSCHOLTZ, Zool. Atlas, IV (p. 3, tab. 17) (1831).—MIDDEND., Sibir. Reise, II, 2 (p. 239) (1853).—SWINH., P. Z. S., 1863, p. 331.—BRANDT, Mel. Biol., VII, 1869, p. 237.—FINSCH, Abh. Brem. Ver., III, 1872, p. 82.—DYBOWSKI, Sitzb. Dorpat. Naturf. Ges., 1881, p. —.—*Id.*, Orn. Centralbl., 1882, p. 40.—*Simorhynchus ps.* SCHLEG., Mus. P. B. Urinat., p. 24 (1867).—*Phaleris ps.* COUES in Elliott's Aff. Alaska, p. 204.—ELLIOTT, Monogr. Seal Isl., p. 134 (1882).—BLAKIST. & PRYER, Tr. As. Soc. Jap., X, 1882, p. 89.—BEAN, Pr. U. S. Nat. Mus., 1882, p. 171.—NELSON, Cruise Corwin, p. 115 (1883).—BLAKIST., Amend. List B. Jap., p. 31 (1884).—*Cyclorhynchus ps.* TURNER, Auk, 1885, p. 159.

1860.—*Phaleris aleuticus* COINDE, Rev. et Mag. Zool., 1860, p. 403 (*nec* PALL., cfr., also Bureau, Bull. Soc. Zool. France, 1879, p. 49).

In order to find out the types of the different generic and subgeneric names of the group *Phaleridinæ* we will have to resort to the "method of elimination." The matter then stands as follows:

1819. Merrem is said to have established the genus *Simorhynchus* (*nec* KEYS & BLAS., 1840, *qui Terekia* BP.) upon *A. cristatella* PALL. As early as 1868 Dr. Coues asked, "Where is this genus named?" but nobody seems to have been able to give an answer. Nor do I know whether Merrem included more species than *cristatella* in this apocryphal genus. Anybody having the opportunity of investigating the matter would gain the lasting thanks of ornithologists by publishing the results—preferably a full extract of Merrem's paper as far as it relates to the present question—in any of the standard ornithological periodicals.*

1820. Temminck, in the second edition of his "Manual," established the genus *Phaleris*, including two species, as he thought, but really three, as *A. tetracula* is the young of a third species and not of *psittacula*, as supposed by him. The three species are *pygmæus* (= *cristatellus* TEMM., *l. c.*); *psittaculus* and *cristatellus* PALL. (= *tetraculus* TEMM., *l. c.*) The latter is already the type of Merrem's *Simorhynchus*, leaving for *Phaleris* the other two, *pygmæus* and *psittaculus*.

1826. It shall here only be remarked in passing that Boie† in this year restricted the genus *Phaleris* to *pygmæus* (*cristella* TEMM. (!), as he calls it), including the other species under *Fratercula*. More conclusive is that, in

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* Should "*Simorhynchus* MERREM, 1819." prove to be a myth only, *Phaleris* TEMM. would stand as the name of the genus with *pygmæus* for type, while for *cristatellus* should be adopted the subgeneric term *Tyloramphus* BRANDT.

† Boie, Isis, 1826, p. 980.

1829 Kaup[*] created the genus *Cyclorrhynchus*[†] for *psittaculus*, which leaves *pygmæus* the type of Temminck's genus *Phaleris*. It may here be added that Bonaparte at last gained the same conviction. He says:[‡] "Le nom de *Phaleris* doit appartenir, malgré M. Gray et comme je l'avais toujours cru, au genre dont *camtschatica*, Lepechin (*cristatella*, Temm. nec Pall.), est le type et l'unique espèce." Also Brandt came afterward to the same conclusion (see Mel. Biol., VII, 1869, p. 227, where the subgenus *Phaleris* only embraces *pygmæus pusillus*). It seems that Eschscholtz[§] about simultaneously with Kaup, but certainly not earlier, named the same genus *Ombria*, but as the certain date seems to be involved in some doubt (I have seen quoted 1829 and 1831[‖]), and as I have no means for investigating the question, I prefer the name of Mr. Kaup as the one the date of which is beyond dispute.

The types of the other genera and the date of their names are too well known to require discussion here. They may all be tabulated thus:

1819. *Simorhynchus* MERREM. Type *cristatellus*.
1820. *Phaleris* TEMMINCK. Type *pygmæus*.
1829. *Cyclorrhynchus* KAUP. Type *psittaculus*.
1828. *Cerorhinca* BONAPARTE. Type *monocerata*.
1852. *Ciceronia* REICHENBACH. Type *pusilla*.

It will thus be seen that each of the species has received a separate generic appellation. The value of these sections can hardly be regarded as equal, some, perhaps, being only of subgeneric importance, but this does not interfere with the question of which name properly belongs to each section, inasmuch as all of them are entitled to recognition. We will therefore have three genera: *Cerorhinca*, *Cyclorrhynchus*, and *Simorhynchus*, the latter composed of three subgenera: *Simorhynchus* (=*Tyloramphus* BRANDT), *Phaleris* and *Ciceronia*.

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[*] Kaup, Entwickgesch. Europ. Thierw., p. 155. "Alken mit kurzem oben wie unten bogenförmig gewölbtem Schnabel."

[†] Nec *Cyclorhynchus* SUNDEVALL, 1836, qui *Rhynchocyclus* CAB.

[‡] Comptes Rend., XLIII, 1856, p. 645.

[§] "Zool. Atlas, IV, p. 3."

[‖] It seems that "part iii" was published in 1829 and "part iv" in 1831, *Ombria* consequently dating from the latter year.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89093	1036	Bering Island.......	May 11, 1882	♂ ad.	234	......	150	43	17	30	43
89094	1260	....do	July 11, 1882	♂ ad.	256	......	149	45	16	31	43
89143	1471	Copper Island.......	July —, 1882	(♂)ad.	......	......	147	42	15	29	42
92948	2082	Bering Island.......	May 23, 1883	(♂)ad.	......	......	150	43	16	31	42
92950	2152	....do................	June 5, 1883	♂ ad.	......	11	152	47	17	32	44
92947	2157	....do................	June 5, 1883	♂ ad.	261	0	147	41	18	30	43
89095	1261	....do................	July 11, 1882	♀ ad.	244	......	145	40	16	31	44
92946	2020	....do................	May 9, 1883	♀ ad.	264	......	145	42	18	30	42
92945	2087	....do................	May 27, 1883	(♀)ad.	(257)	......	147	43	15	30	43
92949	2227	Copper Island.......	July 3, 1883	♀ ad.	256	6	144	44	14	29	40

No. 89093.—Iris white. Bill salmon red; nasal shield darker, grayish brown; soft part along base of upper tomia whitish flesh color; interior of mouth whitish. Feet bluish white, tinged with yellow; on the joints a well-defined dusky spot; webs blackish, along the toes bluish white; side of tarsus and toes, as also the nails, black.

No. 92946.—For the color of the bill, which was more yellowish than any other seen before, reference is made to the colored drawing pl. *f*, immediately made from the fresh specimen. Feet bluish gray; diameter of eggs in ovary 8$^{\text{mm}}$.

Before proceeding to discuss the different changes which the bill and plumage of this species are subject to, I wish to call attention to a structural feature of its bill which hitherto has passed unobserved or, at least, unrecorded. The reason why it has been overlooked for so long a time can only be explained by considering the fact that the peculiarity which I am going to describe is only tangible in fresh specimens.

Dr. Dybowski (Orn. Centrbl., 1882, p. 40) says that "in this species the soft parts at the angle of the mouth are wanting altogether." This is correct, if only the "rosette" is meant, which, indeed, is wanting in all the *Phaleridinæ*, consequently also in the present species. But it is not correct if it be understood to mean that no soft parts are situated near the corner of the mouth.

In fresh specimens there will be found at the base of the tomia of the upper mandible a soft tumor of lengthened form, commencing a little behind the posterior corner of the nostrils and following the tomia backwards, gradually becoming absorbed into the soft membrane lining the corner of the mouth. It occupies the space between the nasal shield and the tomium, and has a slight depression on the upper surface, which, when the excrescence dries up, in the prepared skin forms a furrow. The color is white slightly tinged with flesh color, and in the fresh bird, therefore, stands out in bold relief against the surrounding parts. On the lower mandible the feathering does not entirely reach the horny part of the beak, and the intervening soft skin is also of a similar white color.

This tumor was perfectly soft in all specimens which I had the opportunity of examining, but as none of these were taken late in the season, and I have never seen a winter specimen, I am unable to say anything about its later development with certainty. In all probability, however, the surface becomes hardened towards the end of the breeding season; it then will scale off irregularly during the course of the late autumn, leaving only a small and not very prominent soft space, which again will commence to swell late in the winter, towards the approach of the propagation time, but, as remarked, this is a hypothesis only.

The shedding of the basal parts of the bill of this species is not so simple as Mr. L. Bureau has conjectured.* In fact, the basal portion is not formed by a single piece, as supposed by him, but consists of several deciduous parts. In the spring these are rather difficult to distinguish because more concealed by the adjacent feathers and more completely fused together. During the breeding season, however, the dividing furrows become more distinct and deeper, showing the following separate pieces:

1. The soft white swelling at the base of the maxillary tomia, the *tomial tumor*. Comp. pl. iv, fig. 6, and pl. v, fig. 1 *a*.)

2. The *nasal cuirass*, an irregular piece above and behind the nostrils, *not* continuous with the corresponding piece on the opposite side. (Fig. 1 *b*.)

3. A small unpaired saddle-piece riding at the base of the culmen, rising knob-like above the latter, and with the ends of its legs just touching the upper corner of the nasal cuirasses. This piece seems to correspond to the "*orlet*" of the bill of the *Fraterculinæ*. (Fig. 1 *c*.)

4. A small depressed and angle-shaped space behind and below the "orlet" and above the cuirass, between these two pieces and the feathering. (Fig. 1 *d*.)

The *tomial tumor* has already been treated of above. It partakes much of the character of the "rosette" in the *Fraterculinæ*, and has probably a similar fate after the breeding season.

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* "Les parties susceptibles de se modifier par l'effet de la mue sont du reste fort simples chez le *psittacula:* elles se réduisent à une seule pièce cornée, la *cuirasse nasale* (pl. v, fig. 2) qui ne fait jamais défaut dans la famille des Mormonidés." (Bull. Soc. Zool. France, 1879, p. 50.)

The other three pieces are distinctly and separately deciduous, as shown by the series brought home by me. It will be sufficient in the following to refer to two specimens only, No. 89095 and No. 92949, as they are fully representative. Both are females, and taken during the first part of July, at a time when the young are still in the nests.

In No. 89095 all the basal pieces are very distinctly individualized, and separated by deep grooves, the post nasal border of the "cuirass" in fact already commencing to separate from the underlying stratum. This is the bird from which pl. v, fig. 1, has been drawn.

In No. 92949, which was taken alive on the nest, containing an egg with developed young in it, is already partially moulting, as the "orlet" has fallen off, and the intermediate pieces (fig. 1 *d*) are cracked in a couple of places, while the cuirass is still firmly attached. In both specimens the anterior, constantly horny parts, are flaking off in thin and irregular chips. These being the only facts in my possession concerning the moult of the horny basal pieces of the bill, I abstain from any generalizations.

As to the moult of the plumage, I have the observation to offer that the wing feathers are moulted after the hatching of the eggs is finished. I received living specimens of this species simultaneous with those mentioned under *Simorhynchus pygmæus*. The appearance and moult of the wing feathers in these birds were so completely identical that every word applied to one species is equally applicable to the other; hence no need of repeating here what is said under the head of the latter species.

The living specimens could not be induced to take any food. They walked semi-upright when moving, like all the members of the family, and such was their position during rest, too, as I have also often ascertained when watching the free living birds; later on, when growing weaker, they would lie down on their bellies.

Their pupils were very large, and the white iris in the living bird, consequently, had the appearance of a narrow ring only. The case was reversed in the dead bird, in which the whole eye was white, with a small black point in the middle.

The pending post-ocular tuft of white feathers was kept close to the body, not forming a bristling crest. These feathers are erectile at the will of the bird, but are usually carried closed together.

The "*Bjele-bruski*," *i. e.*, the white-breasts, are common, in suitable places, on both islands, though not very numerous, breeding in steep, cracked, and inaccessible rocks both on Bering and Copper Islands, especially in those places which are called "Nepropusk," that is, steep rocks rising straight out of the sea prohibiting any passage along the beach. Such places are found near the main villages on both islands, and in both places there are nesting colonies of these birds.

They arrive in the Commander Islands about the end of April. In 1883 the first three were observed on Bering Island at the Reef Point Nepropusk on April 28. On the 2d of May they were numerous at the same place. It is especially in the early morning that these birds are seen, the best time being about 4 o'clock during the spring, and also at the same hour in the afternoon, as the rest of the day, before the breeding has begun, is passed way out at sea, and after that time in the deep holes of the rock, in which the nests are located. At the time mentioned they may be observed sitting on the rocky ledges outside the opening of the nest-cave, usually only solitary pairs, but before the breeding commences often in small companies.

Their voice is a clear vibrating whistle, somewhat resembling that of *Cepphus grylle* and *columba*.

When the full grown young have left the nest all seek the high ocean, disappearing completely from the island, and not a single specimen could be secured during the latter part of the summer. Where do they go in winter? They probably stay on the ocean further south than their allies, for while *Simorhynchus cristatellus*, *pygmæus*, *pusillus*, *Lunda cirrhata*, and *Fratercula corniculata* all were obtained during the winter, not a single Bjelebruschka was seen or heard of, nor was it ever during that season picked up dead on the beach after heavy gales.

14. Lunda cirrhata PALL.

1769.—*Alca cirrhata* PALL., Spicil. Zool., V, p. 7, pl. i, et pl. ii, figs. 1, 2, 3.—KITTL., Denkw. II, p. 205 (1858).—BOLAU, J. f. Orn., 1880, p. 132.—*Lunda c.* PALL., Zoogr. Ross. Asiat., II, p. 363 (1826).—COINDE, Rev. Mag. Zool., 1860, p. 403.—DYBOW., Sitzb. Dorpat. Nat. Ges., 1881, p. —.—*Id.*, Orn. Centrbl., 1882, p. 40.—*Id.*, Bull. Soc. Zool. France, 1883, p. 349.—NELSON, Cruise Corwin, p. 115 (1883).—STEJNEGER, Naturen, 1884, p. 54.—TURNER, Auk, 1885, p. 159.—*Mormon c.* KITTLITZ, Isis., 1831, p. 1104.—*Id.*, Kupfertaf., p. 3, taf. 1, fig. 2 (1832).—MIDDEND., Sibir. Reise, II, 2 (p. 240), (1853).—SCHRENCK, Reis. Amurl., I, p. 503 (1860).—SWINH., P. Z. S., 1863, p. 331.—DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 308.—DALL, Avif. Aleut. Isl. Unal. eastw., p. 10 (1873).—*Id.*, Avif. Aleut. Isl. west Unal., p. 10 (1874).—TACZAN., J. f. Orn., 1876, p. 203.—*Id.*, Orn. Faun. Vost. Sibir., p. 75 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 52.—*Id.*, *ibid.*, 1882, p. 398.—

BLAKIST. & PRYER, Ibis, 1878, p. 210.—*Iid.*, Tr. As. Soc. Jap. VIII, 1880, p. 179.—*Iid.*, *ibid.* X, 1882, p. 88.—SEEB., Ibis, 1879, p. 21.—PALMÉN, Swed. Cat. Lond. Fish. Exh., p. 201 (1883).—SAUNDERS, Ibis, 1883, p. 348.—BLAKIST., Amend. List B. Jap., p. 20 (1884).—*Fratercula c.* VIGORS, Zool. Voy. Blossom, Orn., p. 33 (1839).—CASSIN, Pr. Ac. Philada., 1862, p. 324.—FINSCH, Abh. Brem. Ver., III, 1872, p. 82.—COUES in Elliott's Aff. Alaska, p. 203 (1875).—ELLIOTT, Monogr. Seal Isl., p. 134 (1882).

1829.—*Fratercula carinata* VIGORS, Zool. Journ., IV, p. 358.

1851.—*Sagmatorrhina lathami* BONAP., P. Z. S., 1851, p. 202, pl. 44.

1858.—*Sagmatorrhina labradoria* CASSIN in Baird's B. N. Amer., p. 904.—DALL. & BANNIST., Tr. Chicag. Acad., I, 1869, p. 309.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Chord of culmen.	Tarsus.	Middle toe with claw.
					mm.	mm.	mm.	mm.	mm.	mm.	mm.
89087	1040	Bering Island	May 11, 1882	♀ ad.	385	......	193	64	65	35	58
92919	2074	....do	May 17, 1883	(♀)ad.	(378)	......	191	64	58	35	60
92921	2133	....do	June 4, 1883	♀	367	10	187	59	58	33	51
92923	2562	... do	Sept. 6, 1883	(♀)ad.	.....	......	192	58	58	36	59
......	2561*	....do	Sept. 6, 1883	ad.	......	......	......	......	......	......	......
92924	2563	....do	Sept. 6, 1883	ad.	......	......	193	62	60	35	58
92925	2772	...do	Sept., 1883	(♂)ad.	......	......	187	60	59	35	60
92926	2773	.. do	Sept., 1883	(♀)ad.	......	......	192	59	57	36	59
92920	1874	.. do	Jan. 19, 1883	♂ ad.	397	8	189	53	53	35	61
92922	1907	....do	Feb. 12, 1883	♂ jun.	391	23	198	62	52	36	60
......	1924†	....do	Feb. 24, 1883	jun.	.....	......	......	......	......	......	......
92933	1667	....do	Sept. 24, 1882	juv.[1]	310	......	144	43	37	37	55
92927	2771	....do	Sept., 1883	pull.[2]	.....	......	136	44	35	33	51
92930	2564	.. do	Sept. 6, 1883	pull.[3]	......	......	105	28	31	29	47
92928	2770	...do	Sept., 1883	pull.[4]	......	......	98	20	33	31	46
92929	2565	.. do	Sept. 6, 1883	pull.[4]	......	......	......	......	31	28	43

* In alcohol.
† Head only.
[1] Only a few downs left.
[2] One-quarter downy.
[3] One-half downy.
[4] Seven-eighths downy.

No. 89087.—Iris creamy white. Bill, terminal part bright salmon red, on upper mandible shaded with brownish, towards the base; basal part light olive green, the cylindrical ridge on culmen more apple-green; the angle of the mouth and the narrow, naked stripe of skin between bill and feathering, and a longitudinal stripe on the "rosette," which is of a somewhat purplish flesh color, vermillion, as is also the naked ring round the eyes. Feet vivid salmon red; soles reddish brown; nails black.

No. 92921.—Iris light grayish cream-color. Color of bill similar to foregoing, but red part of bill more orange, and the green parts, except the crest on the top of culmen, duller and more brownish; eye-ring also less bright. Feet more orange colored. Fat. Eggs swollen.

No. 92920.—Iris dirty white, with a faint creamy tinge. Bill, fore part vivid salmon red, with dark brownish shades at tip of upper mandible and between the last groove and the basal part, which is dark brown, with the tomium of upper mandible reddish anteriorly and brownish flesh color posteriorly; the brown of the lower mandible is mottled with brownish flesh color; angle of mouth orange colored, as is also the mesial furrow of the "rosette," which is light flesh color. Feet very pale salmon-red, brownish beneath. Very lean. Stomach contained a blackish brown, tar-like fluid.

No. 92922.—Iris light yellowish gray. Bill, terminal part orange-red, more brownish towards the tip; tomia dark brownish, as is also the basal part of both mandibles, which is quite soft; the "rosette" light brownish flesh color; furrows and corner of mouth dull orange. Feet whitish, with a tinge of yellowish flesh-color, and shaded with faint greenish blue on the joints and along the toes; webs light dirty reddish brown; tarsus and toes beneath dark brown; nails black. The feathers of the ear-tuft not yet fully out, their bases still in the sheaths. Very lean.

No. 92933.—Iris dark brownish gray. Bill brownish gray, darker on the basal portion, tip blackish; the "rosette" similarly colored; naked eye-ring blackish; interior of mouth light flesh color. Feet light pearly gray, each scutellum with a brownish spot in the middle; webs, soles, and nails blackish.

No. 92930.—Iris grayish brown. Color of bill like that of the foregoing, but a little darker, especially on the upper mandible. Feet of a middle gray, with a faint tinge of yellowish olive; webs and soles blackish.

No. 92929.—Iris grayish brown. Colors only a trifle lighter than in the foregoing.

There is still great confusion and uncertainty among authors concerning the changes of plumage and bill ornaments in the two groups, *Fraterculinæ* and *Phaleridinæ*. The observations which I have had the opportunity to make in regard to the moult of the wing-feathers of the latter, and which are recorded under the head of *Simorhynchus pygmæus*, are conclusive, and sufficient as far as this group is concerned, there being no previous investigations published that I am aware of.

The moult of the wing feathers of the *Fraterculinæ* have been studied in *Fratercula arctica*, among others, by Mr. Gerbe.* The process is said to be performed in April, at the commencement of the general moult, and before the season of the propagation begins. The moult is said to take place in such a manner that the primaries are thrown off simultaneously, the secondaries following a few days after, thus reducing the wings to mere fins, and making the bird incapable of flight for several days. (Cf. Bureau, Bull. Soc. Zool. France, 1879, p. 17.)

It will be seen that this process is exactly the reverse of what I have shown to take place in the *Phaleridinæ*, in which the moult occurs after the breeding, being, besides, gradual and normal in every respect.

None of the specimens of *Lunda* or *Fratercula* collected by me, although from different seasons, were in the act of moulting, and my material of these species is therefore less conclusive than that of *Simorhynchus pygmæus*. The condition of the wing-feathers in the different specimens, however, indicate, with a probability very nearly approaching absolute certainty, that the moult of the remiges in *Lunda cirrhata* and *Fratercula corniculata* does not differ materially from that of the *Phaleridinæ;* consequently that it is a postnuptial, and *not* a prenuptial moult. This is pretty evident from the fact that my September specimens have the remiges much blacker, and fresher than those killed in May, in fact, quite new and perfect, while the female collected in the beginning of June has the remiges worn, and with all signs of being old feathers, ready to be exchanged for new ones after the incubating season.

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* Observation sur la manière dont s'accomplit la mue des rémiges chez le Macareux moine (Rev. et Mag. de Zool., 1875).

I may, therefore, be excused for doubting the correctness of the statement that there is a prenuptial moult of the wing-feathers in *Fratercula arctica*, the much more so as the material of the latter, which I have been able to examine, in no way corroborates the observation of Mr. Bureau. That the process should be so radically different in the two species of *Fratercula* is more than improbable. The question as to the moult of the remiges of *F. arctica* may yet be regarded as an open one, and ornithologists, having the opportunity of making observations should not omit them in the belief that all is known about the matter.

About the moulting of the rest of the plumage in spring the previous statements are conflicting. Bureau (l. c.) says that the spring moult is complete, while Dr. Dybowski (Orn. Centrbl., 1882, p. 40) asserts that "in spring the moult is only partial," and restricted to the outgrowth of the ornamental feathers, and the moult of the wing and tail-feathers. Whether the latter statement, about the wing and tail-feathers, pretends to be based upon actual observations cannot be ascertained, and may therefore be regarded as valueless in view of the remarks above. As to the moult of the contour feathers, however, Mr. Bureau is undoubtedly correct, as I can testify from actual observation, only with the addition that the regular time is not in spring, but in the latter part of the winter. It may be remarked, though, that the individual variation in this respect is very great, as in so many other sea birds.

Dr. Dybowski has of late (Bull. Soc. Zool. France, 1884, p. 348) advanced another erroneous theory in regard to the moult of *Lunda cirrhata*. He states that the young of the latter in the first plumage has the under surface pure white, and that the same birds early in spring, before the spring moult, are dark all over, as are the adults. He, therefore, concludes that a moult must have taken place between these two phases, "something similar to that which occurs in the young *Tetraonidæ*" (!). In the first place, the young of *Lunda cirrhata* in the first plumage is not pure white below; they are of a light gray underneath, gradually deepening towards the chin. The shade of this gray is exceedingly variable, however; in some quite light, almost whitish; in others much deeper, corresponding to a similar variability of the intensity of the dark under surface of the adults; and of the four half-fledged young collected by me, and partly yet in the down, no two are exactly alike, while the full-grown young bird obtained in February (No. 92922) is completely intermediate in color between the former and the old birds. This would indicate a gradual darkening of the first plumage of the young; at any rate, no second moult takes place before the regular prenuptial moult.

In default of a better opportunity, a curious mistake of Mr. Bureau may be corrected in this connection. He asserts, with the greatest positiveness, that the female of *Lunda cirrhata* differs from the male in being destitute of the long, pendant yellow ear-tufts (Bull. Soc. Zool. France, 1879, p. 33). This statement is completely unfounded in nature, as the female in external structure and coloration is absolutely indistinguishable from the male. I have seen thousands and thousands of both sexes during the breeding season, and they are all alike; there is not a single untufted adult bird on the rookeries at that period.*

As the same author seems to believe that the summer and winter plumage of this species are identical (Bull. Soc. Zool. France, 1879, pl. iii, fig. 3, which, though having tufts and white mask, is a "restauration" intended to illustrate the winter plumage, and p. 33, where he most positively and most erroneously asserts that the plumage of the adult male in winter is "absolument semblable à celui des noces"), a brief review of the sequence of the different plumages and their coloration may, perhaps, not be out of place.

In August and September the downy young, still in the nest-holes, become clothed with their first feathers in place of the dark fuliginous down. In this plumage, which is wholly developed before they leave the nest, the upper surface and the under tail-coverts are more or less glossy black; the sides of the head are blackish gray; under surface deep ashy on the chin and throat, fading backward into a light gray, the intensity of which differs individually to a considerable extent, darkening, as it appears, during the course of the winter. About the middle of February, earlier or later in the different individuals, according to the time when they left the egg, the first moult of the contour-feathers commences, the ear-tufts at the same time making their appearance; these are at first of an isabella-brown color, afterwards changing into pale straw-yellow, (plate ii, fig. 4). The under parts of the new plumage are darker (though never glossy), and the contrast between the under tail-coverts and the rest is, consequently, less conspicuous, but the most radical change occurs in the coloration of the face, which now assumes the white "mask," and the young of the year is now indistinguishable from the old birds as far as plumage is concerned.

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* Mr. Bureau's positiveness about this point is quite illustrative of the usual generalization of many ornithological writers. He had two specimens (apparently without authenticated dates) before him, said to be females, which had not the ear-tufts grown fully out (cf. "*aigrettes*, dont le point d'implantation est indiqué par une tache jaune paille"). And upon this extremely scanty material he boldly asserts: "Pallas, et, depuis lui, tous les auteurs que ont écrit sur cette espèce, considèrent *à tort* la femelle comme étant absolument semblable au mâle et pourvue d'aigrettes." If Mr. Bureau had taken the trouble of raising the feathers of the "tache jaune" he would have found them still in their sheaths, the yellow spot being formed by the tips of the ear-tufts in the progress of development. (Cf. Bureau, l. c., pp. 33, 34.)

As mentioned above, the material at hand seems to justify the conclusion that remiges and rectrices are not shed at this moult, but at the next one, which takes place in September (earlier or later according to circumstances), or when the incubation is finished. At this moult the long ear-tufts are thrown off, the white "mask" is replaced by blackish gray feathers; all the other feathers are likewise shed, without any change, however, in the general color of the rest of the plumage. It has also been mentioned above that the time when the moult takes place is very variable in different individuals, a fact which should always be borne in mind. On the 22d of August, 1882, I observed a single old bird, with large red bill, having already changed its mask and dropped the ear-tufts, but it was the only one in a large flock of many hundreds; on the other hand, individuals are found which have not assumed their winter plumage as late as the end of October. The adult bird in winter is represented in fig. 2, pl. i.

Parallel with and corresponding to this moult of the plumage the remarkable shedding of the basal parts of the bill takes place. Mr. Bureau has the honor of first having pointed out this fact, but for want of sufficient material he had to content himself mostly with hypotheses and assumptions, consequently falling into several errors. Dr. Dybowski afterwards observed parts of the process, but, not content with the facts observed, went on speculating, and, needless to say, consequently, also made grave mistakes. It will, therefore, be expedient to point out and correct these before proceeding to a detailed account of the process as it actually takes place.

The figures representing the heads of *Lunda cirrhata*, and accompanying the two articles of Mr. Bureau are not only crude, but in several points absolutely erroneous, it being sufficient to compare fig. 4 of pl. v, Bull. Soc. Zool. France, 1877, with those on pl. iii, *op. cit.*, 1879, particularly the grooves, the crest, and the lower end of the horny "*orlet*,"* not to speak of the color of the deciduous parts which are painted red instead of green, and of the "rosette," which is made bright yellow instead of flesh color.

Mr. Bureau asserts (*op. cit.*, 1879, p. 39) that the mental cuirass is uniform in color with the rest of the under mandible, so that its existence is hardly suspected when the bird is in full summer or winter dress. From my drawings and descriptions it will be seen that such is not the case. That piece is *always* differently colored from the rest of the mandible (except in the young birds), the latter being always red, while the former is green in summer and deep brown in winter. It is not more correct when he says (*l. c.*) that the "atrophic triangle" is so much reduced that its retraction does not sensibly modify the outline of the inferior mandible. A glance at my figures on pl. i shows at once that the lower outline of the mandible is considerably different in summer and winter, the gonydeal angle being, in fact, situated at the middle of the mandible during the latter season, while in summer the corresponding point is placed within the basal third of the mandible.

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* I follow Mr. Bureau's nomenclature of the different basal pieces as closely as possible. The following is a synoptical table of his terms with reference to the figures on pl. iii, B. S. Z. F., 1879, together with the equivalents employed by Dr. Elliott Coues in a review of Bureau's discovery in the Bull. Nutt. Orn. Cl., 1878, p. 89, and by Dr. Theo. Gill in an article of similar object in Baird's "Annual Record of Science and Industry" ("Harper's"), 1878, p. 480. In the last column will be found the English term corresponding to the French appellation, which I propose to adopt.

B. Z. S. F., 1879, pl. iii.	French appellation by Mr. Bureau.	Terms employed by Dr. E. Coues.	Terms employed by Dr. Th. Gill.	Terms employed in the following account.
Figg. 1 and 4 *a*	*Ourlet corné*	Boss	Basal lamella	*Horny orlet.*
Figg. 1 and 4 *b*	*Cuirasse nasale*	Nasal buckler	Supranasal saddle.	*Nasal cuirass.*
Fig. 4 *c*	*Lamelle sous-nasale.*	Subnasal lamellæ.	Subnasal lamellæ.	*Subnasal lamellæ.*
Figg. 1 and 4 *f*	*Lisèré corné*	Horny selvage	Mental lamellæ	*Horny selvedge.*
Figg. 1 and 4 *g*	*Cuirasse mentonnière.*	Mental buckler	Inverted saddle	*Mental cuirass.*
Fig. 1 *i*	*Rosace*	Rosette		*Rosette.*
Fig. 3 *a′*	*Ourlet membraneux.*	Membranous boss.		*Membranous orlet.*
Fig. 3 *b′*	*Membrane nasale.*	Nasal membrane		*Nasal membrane.*
Fig. 3 *f′*	*Lisèré membraneux.*	Membranous selvage.		*Membranous selvedge.*
Fig. 3 *g′*	*Matrice mentonnière.*	Mental matrix		*Mental matrix.*
Fig. 3 *b″*	*Cimier membraneux.*			*Membranous casque.*

The horny subcylindrical protuberance at the base of the culmen is not marked by a distinctive letter on the figures; in the text it is called "*cimier corné*," a term here transcribed by "*horny casque*."

Dr. Dybowski's mistakes are more serious. In the article in Ornith. Centrbl., 1882, he says *positively:* "During the further development of the moult the entire fore part of the bill scales off and assumes a dark color; the entire head becomes covered with black feathers, and the iris becomes blackish brown." And to strengthen his assertion he adds in a foot-note in this very place: "In my collection all these stages of moult are represented by splendid specimens."[*]

Nevertheless, this startling discovery of the shedding of the anterior part of the bill, too, is not at all based on facts, being a mere supposition, young birds having been mistaken for adults. Dr. Dybowski himself has afterwards become doubtful about this point, which, at first, was asserted with so great positiveness. His doubts are expressed thus in the Bull. Soc. Zool. France, 1883, p. 349: "I am convinced that the worn bill cannot obtain the form it has in spring without having first changed its *entire* superficial sheath. Therefore, *although I do not possess such a sheath*, I persist in my conviction that the bill is wholly shed,"[†] (italics mine). What has become of the "splendid specimens of *all* the stages of shedding"? It is, then, clear that the "discovery" is not founded upon observation but upon a "conviction." The mistake rests upon the circumstance that he got young birds, some with light and others with dark colored undersides; the latter he took for adults, not taking into account that the former were obtained in November (B. S. Z. F., 1883, p. 348) while the latter were taken later in winter and spring (Orn. Centrbl., 1882, p. 28).

The wear and tear of the anterior part of the bill is overcome and remedied by the same process as in other birds, the external horny layers flaking off irregularly, substituted by the successive growth of the underlying ones. There is no need of assuming a regular shedding of that part, and most certainly it does not take place; conclusive evidence, besides, is furnished by No. 92920 (pl. i, fig. 2).

The statement of Dr. Dybowski that the iris of the adults changes from whitish to blackish brown is a result of the same confusion of the adults and young, and so is the assertion that the color of the whole bill of the adults is dark in winter.

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[*] Im weiteren Verlauf der Mauser schält sich der ganze vordere Theil des Schnabels und bekommt eine dunkle Farbe; der ganze Kopf bedeckt sich mit schwarzen Federn und die Iris wird schwarzbraun. In meiner Collection sind alle diese Mauser-Stadien durch practvolle Exemplare repräsentirt. (*L. c.*, p. 40.)

[†] Je suis persuadé que le bec usé, ne peut parvenirà sa forme de printemps qu'après avoir changé en entier son fourreau super Ainsi donc, quoique je ne possède pas de fourreaux pareil, je persiste dans ma conviction que le bec mue en entier,

Other misstatements as to the color of the naked and soft parts have originated in describing them from dried skins, or at least from specimens not absolutely fresh. This is evident, for instance, where the bill and feet of the young birds are described as black (Orn. Centr., 1882, p. 29: "Beine immer noch schwarz"), and the rosette of the adults as "pæonia-red."

Another mistake is probably due to lack of material, the stage in question *not* being represented in the "splendid" series. I allude here to his statement (Orn. Centrbl., 1882, p. 30) that when the horny orlet falls off it is replaced by *black* feathers. The fact is that the feathers which are growing out when the orlet drops off are *white*, as my specimens conclusively prove; this part drops off before the white face-mask has changed to black; when that change takes place then the white feathers on the "membranous orlet" are first exchanged for black ones.

The series of plain and colored drawings which accompany this account were carefully prepared on the island from specimens perfectly fresh and still in the flesh; they were not merely sketches, but *finished* on the spot, and have not been touched since. I claim for them the merit of being true in outline and color. They illustrate most of the different stages of development and transformation, and, in consequence, are frequently referred to in the following, as they certainly convey a better idea of the specimens than the most explicit description; besides, the descriptions have been given above under the remarks following the "list of specimens collected," p. 44.

The color and shape of the bill of the downy young (pl. ii, fig. 1) is exactly that of the more developed young represented in the same plate, fig. 2. Passing through the stage of fig. 3, the bill grows gradually during the winter, simultaneously reddening in the anterior part. Birds hatched very early will have attained a development corresponding to fig. 4 at the middle of February, while late birds at the same time will not have advanced farther than the stage represented by fig. 3. The next step is the swelling and growth and subsequent hardening of the basal parts accompanied by their change of color into an olivaceous green. At the same time the semilunar vertical grooves on the anterior part of the upper mandible commence to be visible. It seems as if they are formed by a constant flaking off, as the superficial corneous layer of the grooves is always more or less lacerated, detached, and in course of scaling, causing the whitish coloration of the grooves. When this process is finished the young bird is essentially like the adults, but whether partaking in the breeding during the first year I cannot say with certainty. I am inclined to think, however, that the still immature birds remain on the high sea away from the rookeries during the breeding season, for I never saw a breeding bird like that shot by me on Copper Island on the 30th of July (fig. 1, text), which even at that late date had the grooves only just perceptible; it was shot a distance off shore, and judging from its conduct and its perfect plumage at that time was not engaged in the incubating business. In all probability this is only a very late bird, holding the same relation to pl. ii, fig. 3, as does fig. 2, text, to pl. ii, fig. 4. But while I feel quite sure that this bird and others of the same stage did not breed that season, I

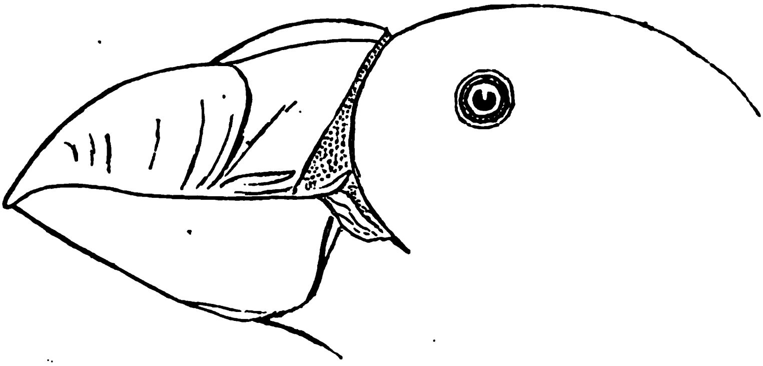

FIG. 1.—*Lunda cirrhata*, jun. Copper Island, July 30, 1883.

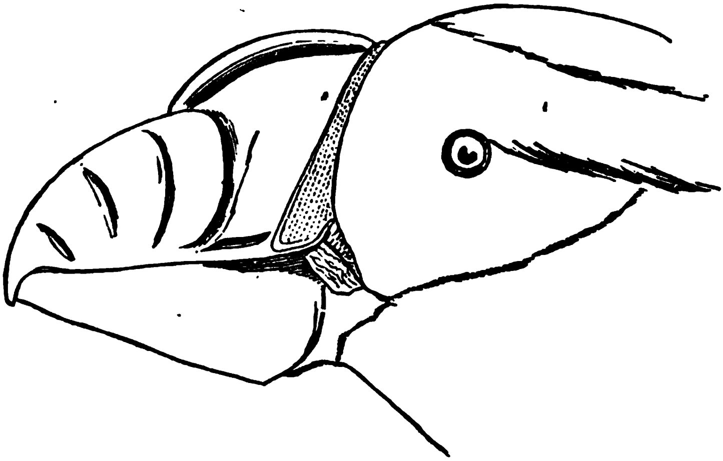

FIG. 2.—*Lunda cirrhata*, jun. Bering Island, June 4, 1883.

am not so certain in regard to fig. 2, text. That bird was picked out of a lot of similar ones which I examined when visiting the rookery on Toporkof Island on the 4th of June, 1883. Here are the remarks concerning these specimens, written down on the spot: "The bill is considerably shorter and lower, and the casque is arched and not straight as in the old birds; the colors are less bright, the red being paler and more orange, and the green more olive, the casque alone being clear apple-green; the rosette is less vivid, the red especially less conspicuous and more pinkish; the naked eye-ring is narrower and more dull colored, while the feet are more orange." These were evidently birds of the foregoing year, and their presence on the rookery so late would seem to indicate that they were going to breed that season, an assumption the more probable, as the eggs in the ovary were quite swollen. It may be, therefore, that the early-hatched birds breed the next season, while those reared late in the year—and downy young are found in the nests as late as the end of September—pass the first summer without partaking in the reproduction.

Towards the end of the breeding season, and a little before the moulting of the contour-feathers commences, the green color of the deciduous parts becomes more brownish, the rosette shrinks, becoming rather pinkish of color, the edges of the different pieces are raised and hard, and the grooves between them deepened. The distinction between the apical and basal parts of the lower mandible, which until then has only been indicated by the difference in color, is now clearly marked by a sharp and deepened line.

The first part to come off is the horny orlet, the process usually beginning in such a way that the orlet bursts on the culmen where it is quite narrow, and much more so than shown in Bureau's figure (fig. 4*a*, pl. iii, B. S. Z. F., 1879), and from the culmen the two detached halves of the orlet flake off downward to the tomia, exposing the membranous orlet, which is now covered with rows of about 1^{mm} long *white* feathers. Next comes the nasal cuirass, which, unlike the former, first detaches itself along the upper margin of the nostrils. This nasal cuirass is separated from the adjacent pieces all around by deep furrows, except at two narrow points behind and in front of the nostrils, and in loosening, these narrow bridges break irregularly. Simultaneously the basal part of the mandible is shed, first loosening along the feather border, then along the tomia until it finally breaks at the lately formed line across the mandible. In Bureau's figure the horny selvedge is represented as a well defined and separate piece; I may therefore remark that in all my specimens the lower half of this piece is connected with the mental cuirass, and that they are shed together; it must be remarked, however, that any violence during the process is apt to break the different parts irregularly. As to the subnasal lamellæ my material does not indicate any shedding, and as they are colored reddish like the persistent part of the bill, and not greenish as the deciduous pieces, I am inclined to think that they are not shed at all.

These changes occur during the months of September and October, some individuals commencing as early as the beginning of the former, while others are not yet through at the end of the latter.

The bird now looks like fig. 2, on pl. i. It will be seen that neither is the anterior part shed, nor dark colored, nor the iris changed to blackish brown, the specimen figured having been obtained on the 19th of January.

In the early part of the next spring the soft parts again become hard and change color, and as soon as the breeding season is at hand the fully adult bird looks like fig. 1 on pl. i.

It may be added that the birds take to the open ocean shortly after the shedding commences, remaining far from any land until the vernal transformation is finished. Only severe storms or excessive cold bring them in winter near the shore.

I observed a few individuals which had four grooves on the anterior part of the maxilla, but out of a hundred birds I found only two or three. These were probably very old birds.

One specimen, No. 92924, shows trace of corresponding grooves on the lower mandible.

The "*Toporok*" (plur. "*Toporki*"), together with the "*Are*" (*Uria arra*), is the most numerous of the many species of the *Alcidæ* on the islands, and as both are also the largest in size, they become of eminent importance to the natives as sources of fresh meat. This is especially the case on Copper Island, the area of which is more limited, and where the inhabitants have fewer facilities for preserving the meat of the fur-seals slaughtered during the short season of the summer. To them the adults, young, and eggs are most welcome additions to their bill of fare, and, indeed, I myself was very often gratified by a good meal of fried "Toporki," for the meat, although very dark, is by no means distasteful. I remember occasions when I thought I had never eaten anything better, when fur-seal-tongues and toporok-breasts were esteemed higher than deer-tongues and goose-breasts are to-day.

But it is not only for food that these birds are used. The skins are carefully flayed off, and made into wide and long, very warm and nice garments, the so-called "*parka*," with the feathers turned inside. About fifty skins are required for one "parka." In order to remove the fat from the skins, they are chewed over and over again by the women and children until all the fatty matter has been chewed out, that being their method of tanning. These "parki" are rather easily torn, but are extremely warm and light, as I can testify from my own experience. Dressed in one I could go driving in a dog-sledge in the severest cold wtihout feeling any inconvenience, and its lightness would allow me to keep it on when strolling about, away from the sledge, hunting ptarmigans or other ornithological and gastronomical objects.

The yellow feathers of the long ear-tufts are in great demand for decorative purposes. The seams of a fine "*Kamlejka*" (rain coat made of seal-guts) is often tastefully adorned with them.

With the beginning of May these birds commence making their appearance on the coasts of the islands,* looking out for their old homes, but for a while they stay mostly on the water, not far from land, until the nests are taken possession of in earnest, which happens about the beginning of the second week of June.

The natives, heartily tired of their winter food, the salted seal meat, look forward to the arrival of the Toporki with great impatience, and as soon as a sufficient number are observed in the neighborhood of the old rookeries parties start off in order to catch a good supply for food and clothing, advantage being taken of the peculiar habits of the birds

I shall in the following attempt a short description of such an excursion:

On a bright afternoon in May—and at that season really some fine, bright days occur, even on the Commander Islands—we started, a gay picnic party, consisting mostly of Aleuts and their wives or lady friends, for the small island Toporkoff, about three miles off from the village. During our passage out only few birds were seen, as it was no "land day," but I was assured that they would be in on the following morning. The Toporki and their allies show during this season, previous to the breeding, the peculiarity of appearing regularly, as it seems, in great abundance near shore on one day, while next day they have all disappeared, staying away on the high sea for two days, when they again take a "land day." The natives had calculated that the following day would be such a regular land day.

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*Dr. Dybowski states that they do not arrive on the coast of Kamtschatka before the second week of June ("Ende Mai. a. St.," Orn. Centrbl., 1882, p. 28). That may be, but it is certain that they appear about five weeks earlier at the islands, for when, in 1882, I landed on Copper Island on the 5th of May Toporki were already plentiful, and in 1883 they were noted as arrived at Bering Island on the 7th of the same month. In fact the first egg was found on June the 12th, which corresponds to the last of May, "old style."

The afternoon passed pleasantly; some were out fishing, the younger members of the party were playing ball, while I was busily engaged in securing specimens of *Troglodytes pallescens*, *Acanthis linaria*, &c., besides odds and ends of plants, insects, mollusks, and crustaceans.

Toporkoff, which has received its name on account of being a rookery of the "Toporki," is a small island consisting of a level plateau about 30 feet above the surface of the sea, rising abruptly from a 50 to 200 feet broad, sandy or rocky beach. The upper surface of the plateau is covered with a thick, hummocky sod, which in every direction is perforated by the numberless holes dug by the "Toporki" and used by them for dwellings to rear their young in.

Water birds were rather scarce near the island, though at a distance large flocks, like black patches, were seen resting on the sea. Now and then a solitary Toporok would cross overhead in its straight flight; a few cormorants (*Phalacrocorax pelagicus*) aired their wet wings on the outlying rocks, stretching their long necks in all directions; noisy gulls (*Larus glaucescens*) flew up and down, screaming and scolding at the intruder.

Evening set in, and the picnic party returned, leaving us men with the bajdarkas. Toporki crossed the island more frequently, but not in such numbers that it was thought worth while to try catching them. A camp fire was started for the preparation of the tea, and soon the indispensable "samovar" was humming its cheerful tune. My Aleuts were unusually silent and dull, and we soon crept into the hull of the bajdarkas, a snug and rather comfortable bed, though smelling considerably from seal-oil, that peculiar smell which characterizes almost everything on the islands, and to which the outsider will have to adapt himself, if he wants to feel comfortable during his sojourn on the seal islands.

The ornithological spectacle at daybreak the following morning was quite different from what it had been the foregoing day. Hundreds and thousands of *Lunda cirrhata* crossed and recrossed the island, coming from all directions, and disappearing on the opposite side, in order to return again and again. A wonderful sight! The black birds, with their conspicuous white face-mask, the long and floating yellow ear-tufts bent like the horns of a ram, and the large green-and-red-colored beaks and red legs, looked more like fantastical creatures of the tropics than inhabitants of the less extravagant north. Their flight seemed to have no particular aim except to view and review the spot where they were going to take up their summer abode, for they flew singly upon their straight courses, no one taking notice of the others. Like black specks they rose from the horizon heading for the island; the nearer they came the bigger they grew, until they passed over us, disappearing as specks again on the other side, and when first started nothing seemed to be able to bring them out of their straight course. These clumsy looking, puffy birds possess, nevertheless, a very rapid flight, so that at the first acquaintance one is rather apt to shoot behind them, but they do not rise very high in the air, especially when passing over the upper plateau of the island.

The natives take advantage of these peculiarities, and their device for catching the Toporki is based upon the apparent difficulty of the bird to make a sudden turn in its straight flight.

A piece of wide-meshed net-work stretched on a hoop, about 4 feet in diameter, fixed to a light pole, 10 to 12 feet long, is the instrument used in catching the Toporki, by suddenly throwing it in the way of the bird, who flies directly into it, and thus falls to the ground and is captured.

When I turned out the Aleuts were already in their places waiting for the rush of the birds, which had not yet begun. They were scattered pretty evenly around the island, seated on the edge of the bluff. Their immovable figures, wrapped in the warm "parka," or the lighter "kamleika," were clearly visible against the gray western sky, and now with the dawning day we discern the net at their side, but, what is more surprising, each one surrounded by a small flock of Toporki. These stretch their necks and point with their bills straight up in the air in quite an unaccountable manner, remaining so long in that rather unnatural position that we become suspicious. A closer inspection reveals that these are only decoys, empty skins held in position by a stick protruding between the jaws and with the other end thrust into the ground.

Before long the sea and the horizon become lively with birds, and soon the sky above us literally swarmed with these red-and-green-beaked, white-masked, yellow-horned masses. It was "land-day," indeed! I only wondered that they did not suffer collision with each other during their airy sailing, for they were thick as May-flies round an electric light, and flew both straight and rapid.

When a Toporok crosses overhead of an Aleut he suddenly raises his net; the bird, unable to turn aside, runs into it with a clash, falls to the ground, and in a twinkling is added to the heap of other unfortunates with broken necks.

When full day has set in this sport is at an end, as then the birds fly higher, and now comes the moment for me and my gun, for we, too, want fresh Toporki for dinner!

To the accompaniment of the buzzing breakfast-"samovar," I wrote down my memorandà on fresh colors, individual variation, moulting, &c., surrounded by hundreds of specimens, selecting desirable objects for skinning, and preparing colored sketches of the fresh colors of bills, eyes, &c., before they fade away and dry up.

After a successful hunt we then returned in the "bajdarkas."

The eggs are white, without gloss, usually with faint lilac spots, which are more numerous in a wreath around the blunt end. Owing to the location of the nests in holes dug in the soil, the eggs are always more or less stained.

Dimensions of eggs.

U. S. Nat. Mus. No.	Collector's No.	Locality.	Date.	Long diam.	Short diam.	State of incubation.
				mm.	*mm.*	
21788	2245	Copper Island	July 12, 1883	71	50	Fresh.
21789	2246	......do	July 12, 1883	68	48	Do.
21790	2283	......do	July 18, 1883	68	45	Do.
20791	2284	......do	July 18, 1883	71	50	Cont. small embryo.

15. Fratercula* corniculata (Naum.).

1788.—*Alca arctica β*, Gmel., Syst. Nat., I., 2, p. 549.

1821.—*Mormon corniculata* Naumann, Isis, 1821 (p. 782, taf. 7, figg. 3, 4).—Kittlitz, Kupfertaf., I, p. 3, taf. 1, fig. 1 (1832).—*Id.*, Denkw., I p. 301 (1858).—Middend., Sibir. Reise, II, 2, p. 240 (1853).—Cassin, Pr. Acad. Philada., 1862, p. 324.—Swinh., P. Z. S., 1863, p. 331.—Dall & Bannist., Tr. Chic. Acad. I, 1869, p. 308.—Dall, Avif. Aleut. Isl. Unal. eastw., p. 10 (1873).—*Id.*, Avif. Aleut. Isl. west Unal., p. 10 (1874).—Taczan., Orn. Faun. Vost. Sibir., p. 74 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 52.—Blakist. & Pryer, Tr. As. Soc. Jap., VIII, 1880, p. 179.—*Iid.*, *ibid.*, X, 1882, p. 89.—Palmén, Swed. Cat. Lond. Fish. Exh., p. 201 (1883).—Saunders, Ibis, 1883, p. 348.—Blakist., Amend. List B. Jap., pp. 29, 31 (1884).—Seeb., Ibis, 1884, p. 174.—*Fratercula c.* Kittl., Denkw. Reise, II, p. 224 (1858).—*Id.*, Journ. f. Orn., 1858, p. 389.—Finsch, Abh. Brem. Ver., III, 1872, p. 82.—Coues, in Elliott's Aff. Alaska, p. 202 (1875).—Dybow. Sitzb. Dorp. Nat. Ges. 1881, p. —. *Id.* Orn. Centrbl., 1882, p. 40.—Elliott, Monogr. Seal Isl., p. 133, (1882).—Bean, Pr. U. S. Nat. Mus., 1882, p. 171.—Taczan., Bull. Soc. Zool. France, 1882, p. 398.—Nelson, Cruise Corwin, p. 115 (1883).—Turner, Auk, 1885, p. 159.

1826.—*Lunda arctica* Pall., Zoogr. Ross. As. II, p. 365 (*part*).—*Fratercula a.* Bureau, Bull. Soc Zool. France, 1879, p. 23 (!).

1831.—*Mormon septentrionale* Kittlitz, Isis, 1831, p. 1105.

1835.—*Mormon glacialis* Audub., Orn. Biogr., III (p. 599, pl. 293, fig. 1) (*nec* Temm., 1820).—*Fratercula g.* Vigors, Zool. Voy. Blossom, Ornith. p. 33 (1839).

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Chord of culmen.	Tarsus.	Middle toe with claw.
					mm	mm	mm.	mm.	mm.	mm.
92930	2076	Bering Island	May 26, 1883	(♂) ad.	(341)	183	70	55	29	30
89088	1209	do	June 14, 1882	♂ ad.	......	173	61	50	30	49
89089	1063	do	May 21, 1882	♀ ad.	......	177	62	51	32	52
89090	1136	do	May 31, 1882	♀ ad.	342	173	61	51	29	49
89091	1178	do	June 8, 1882	♀ ad.	343	188	65	50	32	51
92932	1920	do	Feb. 24, 1883	♂ jun.	357	174	64	40	31	51

No. 89089.—Iris, dark gray with a tinge of brownish. The soft "eye-horns" brownish black with a delicate, silky gloss; naked eye-ring vermilion. Tip of bill, until between second and third groove, salmon-red along culmen and gonys, elsewhere brownish red; base of bill very light and bright lemon yellow, the callosity at the corner of mouth bright orange, as is also the interior of the mouth and the tongue. Feet colored between salmon-red and flesh-color; webs scarcely darker; under side of tarsus and of outer and inner toes brownish; that of the middle toe and of the webs only a little deeper red than the upper surface; nails brownish black.

No. 89090.—Iris dark brownish gray. Bill: Tip blood-red, brownish behind and below, border of hind groove almost black; basal part light lemon yellow; callosity at corner of mouth bright orange. Eye-ring vermilion; horn above and below the eye brownish black with silky gloss. Feet reddish orange, outside paler, livid; soles reddish brown.

No. 89091.—Iris brownish gray.

No. 92932.—No detailed description of the color of the bill made, as it was drawn and painted immediately (see pl. iii, fig. 3). Feet whitish flesh-color tinged with bluish; webs brownish gray, tarsus and toes below blackish brown. Stomach empty. Very lean.

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* The application of the generic name, as indicated in Coues's second check-list, seems somewhat far-fetched (in the second edition of the "Key" he asks, "What appli-

Dr. Dybowski is only partly correct when he (Orn. Centralbl., 1882, p. 40) describes the feet of this species as "orange yellow" (*orangegelb*). The color varies considerably, being much paler before the breeding season, so pale even that it often approaches dirty flesh-color. The brightest color is assumed in May or June, during which months the feet are of an intense red, in some cases tending to salmon color, in others to orange; but out of the many scores of these birds examined by me at that time not a single one had the feet yellower than a rich "reddish orange," this being the extreme and the exception. The soles are usually lighter or darker reddish brown. It is only after the breeding season that the feet of the adult birds assume an orange yellow color, a change which takes place in the latter part of July, at which time the webs are even brownish orange, this color lasting until late in the following winter. In an old bird obtained on February 24, 1883, (L. S. No. 1915) I find the colors described as follows: "Feet orange yellow, webs more reddish; tarsus and toes below dark brown." In the young bird during winter the feet are almost white, with brownish gray webs.

I must also add that I never saw an iris which could be termed "whitish gray or brownish white" (*weisslich grau, oder bräunlich weiss* Dybow., *l. c.*) It was invariably rather dark brownish gray; in fact so dark as to almost do away with the color of the iris as a distinctive character of this group of birds.

From my plate and the description of the fresh specimens, as given above, it is clear that the coloration of Bureau's figure of the head (Bull. Soc. Zool. France, 1879, pl. ii) is entirely erroneous. His "Figure idéale de l'adulte en hiver" (*l. c.* fig. 2) is better, although the outlines of the

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cation?"). *Fratercula* is probably a comic diminutive of *frater* in the sense of a member of a brotherhood of monks (friars), on account of its plumpness of figure and its ridiculous grave air. This supposition is confirmed by analagous vernacular names in different languages. Faber tells us that *Fratercula arctica* in Iceland is often called "Prestr" (priest), "seiner Gebährden auch seiner Farbe wegen" (Isis, 1827, p. 664). Compare also the French name *Macareux moine* (moine = monk), and the Italian *Fraticella*. Naumann quotes as German vernaculars "*Das Brüderchen, der Mönch*," though these may possibly have originated in translation, the former from the Latin, the latter from the French.

The German name for the Sea-Parrots, "*Maskentaucher*" or "*Larventaucher*," does not apply to the bill as the "mask," but to the whitish patch of the face, for which Naumann expressly uses the word "Gesichtsmaske." The generic name *Larva* has the same application, and *Mormon* is only the Greek equivalent for *Lârva*; "*larvata*" is a common designation for a bird having the face colored differently from the other parts of the head. Of course, "Larventauscher" is a mere misprint (cf. Coues, Bull. Nutt. Orn. Cl., 1878, p. 88).

soft parts are somewhat wrong, as will be seen by a comparison with my figure drawn from the fresh specimen. But he commits a rather curious mistake in the same figure by retaining the summer coloration of the plumage, when it is intended to show the bird as it is in winter. My figures, both of the adult and the young, obtained February 24, 1883, are taken from the fresh specimens, and are so accurate and detailed as to make a special description of them superfluous. His suppositions as to the shedding of the different parts is undoubtedly correct.

A few corrections to his article (*op. cit.* pp. 28–31) are necessary, however. It is superfluous to call attention to the erroneous description of the color of the bill which is given as "orangé, unicolore."

"Sommet de la tête d'un noir grisâtre" (*l. c.*, p. 29, top of head of a grayish black), gives an entirely wrong idea of the color of the cap, which is blackish *brown*, contrasted strongly and in a well-defined straight line across the nape with the glossy black of the neck and back.

The term "horns," for the deciduous caruncles above and below the eyes is very misleading. Being hard in the dried specimen, the general impression is that these "horns" are "horny" in the living bird, and that this is also the opinion of Mr. Bureau is evident from his expression, "deux appendices *cornés*, allongés, libres, *en forme de cornes* d'un gris de fer." This is a mistake, however, for the "horns" are only soft and flexible caruncles or wattles, covered with a delicately glossed skin, as if made of silk, which, moreover, is not "d'un gris de fer," but of a decided blackish brown. The "horns" are soft as late in the season as I had opportunity of examining specimens. I have no note, however, of any later than the beginning of August.

The winter plumage differs from that of the summer bird only in the coloration of the sides of the head, which at that time are blackish in front of and round the eyes, shading into gray behind and below.

The young in the first plumage are similarly colored, only somewhat duller, and the color of the under parts is absolute pure white, differing in that respect from the young of *Lunda cirrhata*, which is always grayish, or washed with this color, at least. The downy chicks are still easier to distinguish, for in *cirrhata* they are uniform black fading into a smoky brownish, while the pullus of *corniculata* has the downs of the breast and abdomen pure white, in strong contrast to the black of the other parts, consequently like the chicks of *Fratercula arctica*.

On the Commander Islands the name "*Ipatka*," or "*Ipatok*," as it is pronounced on Copper Island, is exclusively used for this species, which here is never called "*Toporok*," a name reserved for *Lunda cirrhata* only.

The Pacific or Horned Puffin is not very common on the islands as compared with the Tufted Puffin (*Lunda*), probably because suitable breeding places are scarce, as they require rather deep holes in rocks or between stones. A few pairs, or where the locality offers more nesting opportunities, some small colonies are found scattered among the rookeries of the other water birds, sometimes higher, sometimes lower than the other species, sometimes in the midst of them, according to where the holes and cracks in the rocks are situated.

As stated above, the nest-holes are found in the rocks, and I never saw a single pair breeding in a hole dug out of the soft ground, as is often the case with *F. arctica*, and invariably, so far as my experience goes, with *Lunda cirrhata.*

The voice is an angry *orrrr* somewhat similar to that of *Uria lomvia arra.*

Their attitude, while walking or standing, is upright, although not so straight as in *Uria.* While walking they touch the ground with the toes and webs only, but rest on the whole sole when sitting.

Superfamily LAROIDEÆ.

Family LARIDÆ.

16. **Larus glaucescens** NAUMANN.

1840.—*Larus glaucescens* NAUMANN, Naturg. Vög. Dentschl, X, p. 351. (*nec* BRUCH 1853?).—KITTL., Denkw., I, pp. 359, 285, 335.—DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 304.—BAIRD, Tr. Chicag. Acad., I, 1869 (p. 842).—FINSCH, Abh. Brem. Ver. III, 1872, p. 83.—DALL, Avif. Aleut. Isl. Unal. eastw., p. 8 (1873)—*Id.*, Avif. Alent. Isl. west Unal., p. 9, (1874).—SWINH. Ibis, 1874, p. 163.—BLAKIST. & PRYER, Ibis. 1878, p. 217.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 189.—*Iid.*, *ibid.*, X, 1882, p. 103.—SEEB. Ibis, 1879, p. 23.—BEAN, Pr. U. S. Nat. Mns. 1882, p. 168.—STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 70.—TURNER, Auk, 1885, p. 158.

1853.—*Larus* (*Glaucus*) *glaucopterus* BRUCH, Journ. f. Orn., 1853, p. 101.—KITTL., Denkw. I, p. 335 (1858).

1873.—*Larus fuscus* PELZELN, Verh. Zool. Bot. Ver. Wien, 1873, Sep. p. 8 (*fide* PELZELN *in litt.*) (*nec* LIN.).

1882.—? *Larus borealis* TACZAN., Bull. Soc. Zool. Franco, 1882, p. 397 (*nec* BRUCH).

1883.—*Larus leucopterus* NELSON, Cruise Corwin, p. 106 (*part* ? cfr. Stejneger, "The Auk," 1884, p. 360).

Quite a considerable amount of confusion has existed in the nomenclature of this species, caused by Bruch, who originally (1853) named a bird *glaucescens* "Licht.," which was not the *glaucescens* of Lichtenstein (?)[*] Lichtenstein's name is only a museum name which would take no precedence over Bruch's *glaucescens* of 1853 if no description had been published prior to that year. In that case the species would have to stand as *glaucopterus* Bruch (ex Kittlitz in MSS.), 1853.

Fortunately enough we have a much earlier description of the type of the Berlin Museum, and that a description which is much superior to any of the descriptions or diagnoses of Bruch or Bonaparte.

This description is found in Naumann's Naturgeschichte der Vögel Deutschlands, X, p. 351 (1840), and as this original and excellent characteristic of *L. glaucescens* has been entirely overlooked by all authors up to the present day, I propose to give a full translation of Naumann's remarks. He says:

"A much nearer ally [to *L. glaucus*] with much greater similarity [to it than to *L. leucopterus*] is a species of the same size, the *L. glaucescens*, of the Berlin Museum, from North America, where it seems to represent our *glaucus*. Although the size and shape (of bill and feet also) of both are very similar, still *L. glaucescens* in the adult plumage is easily distinguishable by the different color and pattern of the primaries, these being uniform bluish ashy gray, with large snow-white tips, the border of the two colors being very distinctly marked across the feathers; the white tips consequently are much more conspicuous than in *glaucus*, in which they pass gradually into the gray color, showing in fact the same pattern as in *L. marinus*, only that in the latter those parts are black which in *L. glaucescens* are but bluish ash. Besides, the mantle of the old *L. glaucescens* is of a somewhat more saturated gull-blue (similar to the color of *L. argentatus*), while in *L. glaucus* it is much lighter or more whitish. The young *L. glaucescens* is likewise distinguishable by the darker brownish gray of the primaries, the white tips of which, however, are less distinctly separated from the dark color, although much more so than in the young of *L. glaucus;* the spots on the mantle are larger and somewhat darker though more blended into the light edges of the feathers, the whole region thus being more broadly but at the same time more indefinitely blotched." To this he adds in a foot-note: "I am ignorant of any minute description or figure of this beautiful large species which in coloration is intermediate between *L. marinus* and *L. glaucus*. It belongs to the more recent discoveries."

Thus *Larus glaucescens* is "hunted down" to the original description!

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[*] Bruch's *glaucescens* of 1855 is the same as Lichtenstein's, however.

Mr. H. Saunders, having examined the type of Lichtenstein's *L. chalcopterus*, 1854 (which, however, is only a nomen nudum), pronounces it indentical with *leucopterus*. What it is, may be regarded as being of little consequence, however, unless it is the same as *Larus* (*Laroides*) *chalcopterus* of Bruch, 1855, which Saunders queries. But Saunders, when putting "*chalcopterus* Bruch" in the synonymy of *leucopterus*, and "*Larus* (*Glaucus*) *glaucescens* Bruch 1853 [*nec* 1855]" in that of *glaucescens* Licht. [=*gl.* Naumann], is certainly wrong, for there can be no doubt that *chalcopterus* Bruch, 1855, and *glaucescens* Bruch, 1853, are the very same thing, whatever may be their relations to the same names as applied by Lichtenstein to specimens in the Berlin Museum. To prove this conclusively I reprint here alongside each other the two monographs of Bruch as far as these names are concerned:

Journal für Ornithologie, 1853, p. 101.	*Journal für Ornithologie*, 1855, p. 281, 282.
III. *Glaucus*. Silber-Möve.	VI. *Laroides* Brehm (statt *Glaucus*). Silbermöve.
10) *Consul* Boie; *glaucus* Brünn. Nord Europa und Grönland.	18) *Glaucus* Brünn., *consul* Boie. Nord Europa und Grönland.
11) *Glaucopterus* Kittlitz. Kamtschatka. Dem vorbergehenden ganz ähnlich bis auf die Schwungfedern, welche hier aschgrau sind mit runden, weissen Spitzenflecken.	19) *Glaucescens* Licht., *glaucopterus* Kittl. Kamtschatka. Dem vorhergehenden ganz ähnlich bis auf die Schwungfedern, welche hier aschgrau sind mit runden weissen Spitzenflecken.
12) *Leucopterus* Faber; *glaucoides* Temm. Nordische Hemisphäre. Unterscheidet sich von *L. Consul* durch die kleinere Gestalt und längeren Schwingen.	20) *Leucopterus* Fab., *glaucoides* Temm. [p. 282]. Nordische Hemisphäre. Dem *L. glaucus* sehr ähnlich, jedoch durch seine kleinere Gestalt und die langen Schwingen leicht zu unterscheiden.
13) *Glaucescens* Licht. Amerikanische Küsten des Behringschen Meeres und Grönland. Dem vorhergehenden ganz ähnlich bis auf die Schwungfedern, die aschgrau sind mit runden weissen Spitzenflecken. Das Jugendkleid ist, wie bei *L. glaucopterus*, dunkelgrau. Bei Holböll als blosse Farbenverschiedenheit von *L. leucopterus* aufgeführt.	21) *Chalcopterus* Licht. Amerikanische Küsten des Behringschen Meeres und Grönland. Dem vorhergehenden ganz ähnlich bis auf die Schwungfedern, die aschgrau sind, mit runden, weissen Spitzenflecken. Das Jugendkleid ist, wie bei *L. glaucopterus*, dunkelgrau.

Notwithstanding Saunders's identification of the types, the names *chalcopterus* and *glaucescens* Bruch, 1853, are left out of the synonymy above, as there is a bare possibility that they may rather belong to *L. kumlieni*, or to *L. nelsoni*, or both (??)

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing beyond tail.	Chord of culmen.	Bill from nostrils.	Height of bill at nostrils.	Wing.	Tail feathers.	Tarsus.	Middle toe, with claw.
			1882.		*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89121	1080	Bering Island.	May 25	♂ ad.	626	20	......	......	......	...	......	......	......
89122	1142	......do........	June 1	♂	670	......	60	20	22	452	782	75	72
89123	1208	......do........	June 12	♂ ad.	......	......	54	24	20	415	162	70	66
92826	1741	......do........	Nov. 21	♀ ad.	603	5	51	24	20	415	178	68	67
			1883.										
92827	2219	Copper Island.	July 2	pull.	......	......	20	......	......	.....	24	......	......

No. 89121.—Iris light yellowish gray. Bill intense lemon-yellow; tips of both mandibles whitish; a vermilion red spot on each side of the angle of the gonys; corner of mouth flesh-color. Naked eye-ring reddish flesh-color. Feet flesh-colored; tarsus faintly tinged with brownish; nails black.

No. 89122.—Iris dirty white with a creamy tinge. Bill yellow with red spot. Feet flesh color; tarsus faintly shaded with bluish.

No. 92826.—Iris faint yellowish white with blackish mottlings. Bill yellowish white, pure straw yellow on culmen in front of nostrils and along tomia; a reddish orange spot with dusky shadings on lower mandible; corner of mouth flesh-color, as is also the naked eye-ring. Feet reddish flesh-color, lighter below; webs more reddish; nails bluish black.

No. 92827.—Iris dark brown. Bill black; tip, abruptly, light brownish flesh-color; angle of mouth dull reddish flesh-color; naked eye-ring dark brownish gray. Feet dark brownish gray.

As in the other members of the genus *Larus*, there is an increase of the white on the primaries with the age of the individual. Thus, in No. 89122 (which is a rather young bird, with the tail still uniform gray, but which has already assumed the bluish mantle), the first primaries are uniform gray with a brownish tinge, and without any distinct pattern.

No. 89121 is somewhat older, having the tail wholly white, except the middle pair of rectrices, which is mottled with gray. In this specimen the primaries are very much worn, but the pattern as it was in the fresh feathers is plainly visible, agreeing closely with several other specimens in the National Museum; on the first primary is a subapical mirror, beyond which the tip is gray, with indications of the extreme tip being white in the fresh feather; the second and third primaries have only small terminal white spots. In No. 92826 on the first primary the mirror is considerably larger, having, besides, united with the white tip in the outer web, and leaving only a narrow bridge of gray separating the apical and the subapical spot of the inner web; the second primary has, in addition to the broader white apex in the outer web, a longitudinal oblong mirror, to which corresponds a larger but not so well defined white spot on the inner web; the third primary has the white tip and the ill-defined white spot, though smaller, on the inner web, without any subapical spot on the outer web, however. These feathers are fresh, in fact, not yet fully out, and the gray parts lying between the spots are of a little more saturated gray than the rest of the quill.

No. 92827 is a downy young, only a few days old. The general color is of a very light grayish brown, whitish on the abdomen, and spotted with blackish on head and upper parts generally. It is very much like the downy young of *L. argentatus*, but has the dark spots and mottlings on the back much darker.

The Glaucuous-winged Gull (Russ. *Tschaika*) is the only gull of the genus *Larus* proper breeding on the islands. Taczanowski (Bull. Soc. Zool. France, 1882, p. 397), however, asserts that he has received birds and eggs of "*Larus borealis*" from Bering Island, a statement not more to be relied upon than that of the same author when he gives *Somateria mollissima* (!) as breeding on the same island. As he does not mention *L. glaucescens* which is so very common, the inference is justifiable that he has mistaken this species for *borealis*, and consequently I put the latter name in the synonomy with a query. It may be, however, that some mistake in the labeling has taken place.

The Tschaika is a very common bird and rather numerous, although less so in winter than during the summer. To the hunting ornithologist they are a perfect nuisance, following him with their penetrating i-a, i-a, i-a—gagagagaga, the latter sounds in rapid succession, warning all the feathered tribes of the approaching enemy.

During and after the sealing season they feed chiefly upon the carcasses of the slain seals, especially on Copper Island, where a constant fight goes on between the tschaika, the raven, and the blue fox. In the fall, when only the skeletons are left, the gulls still visit the killing-grounds, which, at that period, are swarming with the big white larvæ of the flesh-fly.

The favorite breeding places on Bering Island are not so numerous as on Copper Island, where these birds breed everywhere all around the shore. On the former island colonies are especially numerous on Toporkof and Arij Islets, at Zapadnij Mys, some inacessible rocks between the northern seal rookery and Saranna, at Tonkij Mys, Staraja Gavan, &c.

Eggs were found in 1883 on Arij Kamen as early as May 16 (U. S.

Nat. Mus. No. 21798, L. Stejneger 1173) and measure 73 by 54.5 and 73.25 by 55^{mm}.

Compared with eggs of *Larus glaucus* those collected by me show a just perceptibly more greenish tinge and somewhat smaller, more numerous, and better defined spots.

17. Larus schistisagus STEJNEGER.

Diagnosis.—White; mantle dark bluish slate gray. First primary, with a long white tip, apical and subapical spots being fused together, and a gray "wedge" on the inner web; second, with a subapical white spot on the inner web only, and the gray wedge further down; third, with the wedge reaching the subapical spot; no gray wedge on outer web of the four first primaries. Feet pinkish flesh-color. Total length 670^{mm}, wing 460^{mm}.

1858.—*Larus argentatus* KITTL., Denkw., II, p. 225 (*part*).
1858.—*Larus cachinnans* KITTL., Denkw., I, p. 336 (*nec* PALL.).—SWINH., P. Z. S., 1863, p. 324.—*Id.*, *ibid.*, 1871, p. 421.—*Id.*, Ibis, 1863, p. 428.—STEJNEGER, Naturen, 1884, p. 6.
1860.—*Larus argentatus* var. *cachinnans* SCHRENCK, Reis. Amurl., I, p. 504.
1867.—? *Larus occidentalis* WHITELY, Ibis, 1867, p. 210 (*nec* AUDUB.).
1871.—? *Larus fuscescens* "Mus. St. Petersb.", MEVES, Öfv. Vet. Akad. Förhandl., 1871, p. 787.
1871.—*Larus borealis* GRAY, Handl., III, p. 113 (*nec* Bruch).
1872.—*Larus marinus* RIDGWAY, Bull. Nutt. Orn. Cl., 1882, p. 60.—BEAN, Pr. U. S. Nat. Mus., 1882, p. 168.—NELSON, Cruise Corwin, p. 107 (1883).
1876.—*Larus pelagicus* TACZAN., Bull. Soc. Zool. France, 1876, p. 263 (*nec* BRUCH).—*Id.*, *ibid.*, 1882, p. 395.—*Id.*, Orn. Faun. Vost. Sibir., p. 64 (1877).
1884.—*Larus schistisagus* STEJNEGER, Auk, 1884, p. 231.—BAIRD, BREWER, & RIDGW., Waterb. N. Amer., II, p. 229, (1884).

In order to find out what my bird is, it may be well first to point out what it is not.

It is *not* (compare pl. vi, fig. 3, and description p. 68), *Larus cachinnans* PALL., with the eye-rings "coccineis," the feet "pallide flavis," and the back like *ichtyaetus*, "intense leucophæa seu cœrulescenti-cana." Nor is it Saunders's *cachinnans*, which apparently is the bird described by Pallas, being distinguished by its "*darker* mantle (than in *argentatus*), *yellow* legs and feet, and the *deep orange-red* ring around the outside of the eye", (P. Z. S., 1878, p. 170). Sclater's *fuscescens* (P. Z. S., 1867, p. 315), has the back "nigrescenti-cinerea," but the feet, "læte flavi." Does not this belong rather to *affinis* than to *cachinnans*? "Chlamyde nigrescenti-cinerea," would hardly do for the latter.

Furthermore, it is *not borealis* of Bruch (*Larus* (*Glaucus*) *borealis* "Brandt," J. f. Orn., 1853, p. 101), which is "considerably larger than *argentatus*, but otherwise similar to this species." Whether *borealis* Brandt, is something different from *borealis* Bruch, I do not know, but I have not been able to find any description of Brandt earlier than Bruch's of 1853. Bruch's *borealis*, at least, seems to belong to *cachinnans* Pall. & Saunders and not to *affinis* Reinh. (cfr. Seebohm, Ibis 1884, p. 32.)

Nor is it *Larus affinis* of Seebohm and Harvie Brown (Ibis 1876, p. 452), which has "yellow legs, and the circle round the eye brilliant vermillion, or the color of a Seville orange." Identical with this is evidently Meves' *Larus cachinnans* (Öfr. Vet. Akad. Förhandl., 1871, p. 786), in which the "legs had a beautiful lemon-yellow color," and the angle of the mouth and the eyelids were "orange-red."

It is *not Larus* (*Dominicanus*) *pelagicus* Bruch (J. f. Orn., 1853, p. 100), which has the back "mostly darker" than *marinus*, and which is "one-fourth smaller than the latter."

It is now time to look for what it is.

In the first place it is v. Schrenck's (and Middendorff's) *Larus argentatus* var. *cachinnans* with dark mantle and flesh-colored feet (Reis. Amurl. I, p. 505). It is also, most probably, the *fuscescens* of the museum in St. Petersburg (fide Meves, *t. c.*, p. 787). I also feel confident that it is the *marinus* from the North Pacific, as given from Alaska by Bean & Nelson. In all probability the *borealis* Seebohm (Ibis 1884, p. 32), is the same bird. Captain Blakiston identified that very specimen, as I learn from his manuscript notes, with the so-called *marinus* from Japan and gives the measurement of the wing as 430^{mm}. . Finally I conjecture Taczanowski's *pelagicus* (Bull. Soc. Zool., France, 1876, p. 263), from the Bay of Abrek, to belong to the present species.

Unfortunately only a single specimen was prepared, but several others were shot at Petropaulski in the latter part of May, and their characters were noted as agreeing completely with those of the specimen from Bering Island.

This specimen may be described as follows:

♂ *ad.* (*U. S. Nat. Mus., No.* 92885; *L. Stejneger, No.* 2007. *Bering Island, May* 5, 1883.) *Measurements.*—Total length, 668^{mm}; tip of closed wings beyond tail, 42^{mm}; middle claw reaches tip of tail, legs stretched backward. Weight, 4 lbs. Wing, 467^{mm}; tail-feathers, 191^{mm}; chord of culmen, 57^{mm}; bill along gape, 81^{mm}; bill from fore border of nostrils, 26^{mm}; height of bill at fore border of nostrils, 22^{mm}; tarsus, 71^{mm}; middle toe with claw, 71^{mm}.

Notes on color of unfeathered parts (see the colored drawing, pl. vi, fig. 3; which was made immediately after the bird was shot; it was not skinned before the next morning, when the eyelids were found to have changed into a vivid red flesh color)—Iris clear Naples-yellow or rather a yellowish cream color. Bill deep gamboge yellow with whitish tips and tomia; an orange red spot on each side of the lower mandible; angle of mouth yellowish flesh color. Naked eye-ring, reddish violet gray. Feet pinkish flesh color; nails horny black with whitish tips.

New feathers were coming out on head, neck, and back, the whole plumage being quite fresh and new.

The whole plumage, except the wings and the mantle, dazzling white.

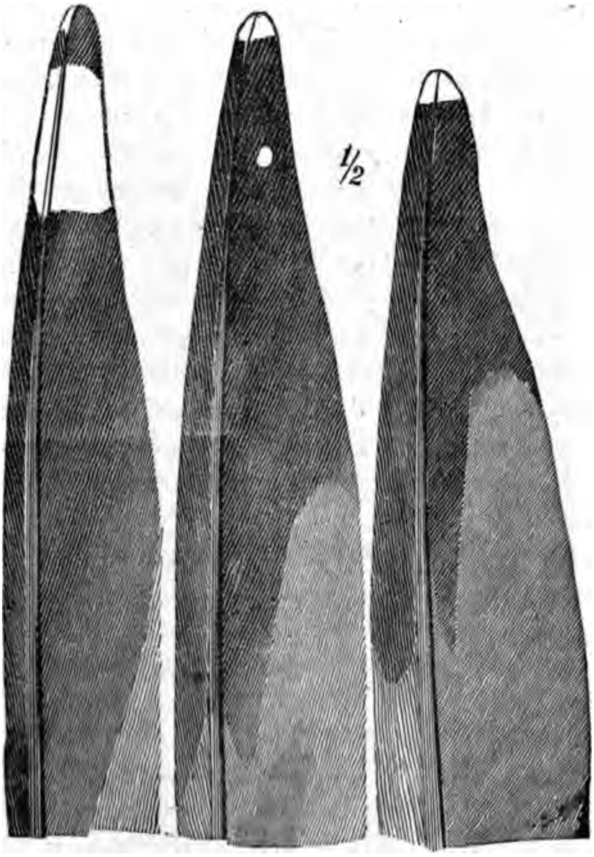

FIG. 3.—First three primaries of *Larus cachinnans*.

The latter pure bluish slate gray without any mixture of brownish, of a shade just between the same parts in *Larus occidentalis* and *L. dominicanus*, being a little lighter than the lightest *L. marinus* I have seen, and easily distinguishable from the latter by the pureness of the gray, which has a decided inclination to bluish. The coloration and pattern of the wings are essentially similar to those of *L. marinus* and *cachinnans* and may be described in detail as under. I may mention that for convenience I adopt Saunders's terms "mirror" and "wedge," the former signifying the white subapical spot, the latter meaning the gray color on the webs from the base upwards. It is further to be remarked that the tips are very little worn.

First primary with the tip almost wholly white, a trace of the black crossbar only visible as a small spot near the edge of both webs; shaft black in the black portion and in the white also; a well-defined bluish slate-colored wedge in the inner web reaches near the tip by about twice the length of the white apex. The second primary has a small apical white spot, and the "mirror" is reduced to a rounded spot in the inner web close to the edge; the gray wedge of considerably greater

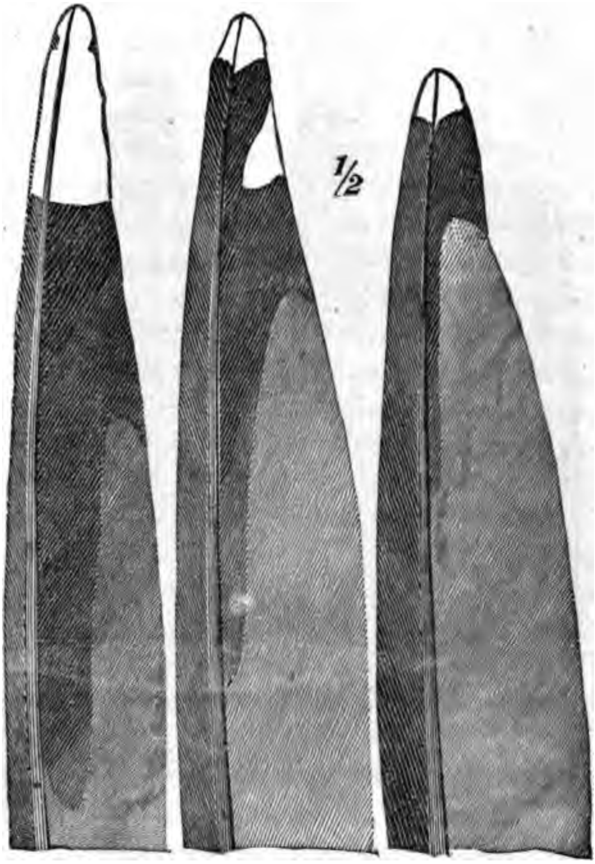

FIG. 4.—First three primaries of *Larus schistisagus*.

extent than on the first primary. In the third the wedge occupies still more of the inner web and reaches the posterior border of the mirror which is larger than on the foregoing and of a different shape, still without reaching the shaft or the outer web, however.* The fourth is essentially similar, and in the fifth a gray wedge occupies most of the outer web too, thus reducing the black to a subapical cross band, precisely as in a specimen of *L. marinus* now before me. None of the foregoing (1–4) primaries have any distinct gray on the outer web.

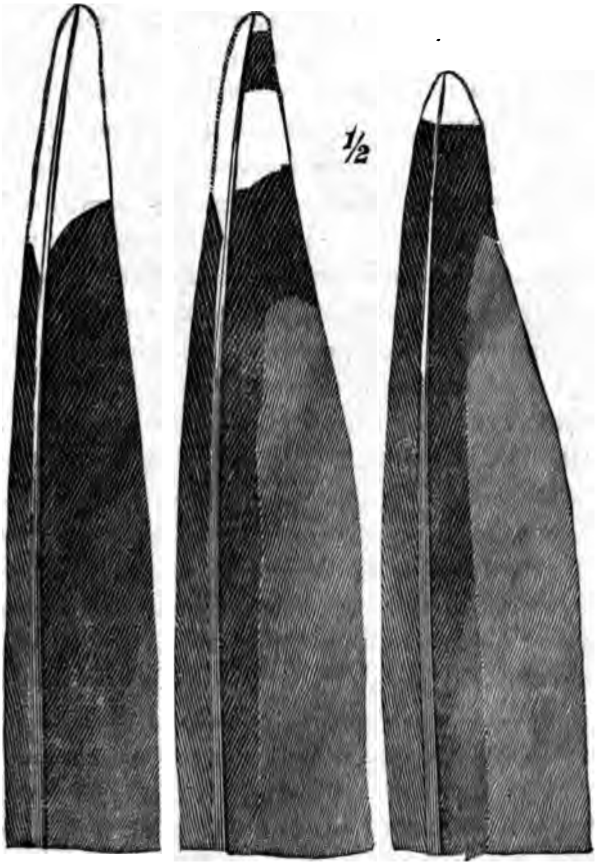

FIG. 5.—First three primaries of *Larus marinus*.

This species is so puzzlingly intermediate between *L. marinus* and *cachinnans* that it is difficult to say to which of these it is most closely allied, but on the whole I am inclined to look upon it as nearer to the former, with which it is placed at first sight on account of the darkness of the mantle, which in the live bird appears to be wholly black.

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* Not well represented in the drawing, Fig. 4.

In size it is somewhat intermediate between *marinus* and *argentatus*. My specimen comes very close to average measurements of *marinus*, while having wings an inch longer than the male specimen from Japan, collected by Captain Blakiston (No. 1085, Hakodadi, March 1, 1878), and determined by Saunders as *marinus*, but which I suppose belongs to the present species. The bill is decidely slenderer than in either of these species, while of the same shape.

The colors of the naked parts are essentially the same, for although the angle of mouth and the eye-ring are rather pale in my specimens, these parts may possibly assume more vivid colors later in the season. The feet are more reddish than in *marinus*, being even slightly more so than in *argentatus*, and without the faintest trace of yellowish.

As already remarked, the shade of the mantel is rather dark, being only a trifle lighter than that of *marinus*, or intermediate between *occidentalis* and *dominicanus*, and exactly of the same tint as in *occidentalis*, only considerably deeper and darker. It consequently needs no comparison with *argentatus* or *cachinnans*, in this respect differing from them nearly as much as they do from *marinus*.

Characteristic of the wing pattern is the presence of a well-developed "wedge" on the inner web of the first primary as distinctive from *marinus*, as well as the absence of a similar wedge on the outer webs of the second to fourth primary, in which it differs from *cachinnans* and *argentatus*. The mirror on the second primary is also peculiar, resembling, however, the pattern of the corresponding quill in *L. cachinnans*. In the third primary the large white spot at the end of the gray wedge is very characteristic. It may thus be seen that while the second primary shows less white than in *marinus* and *argentatus*, the third has more of the same color than is the case in the latter two species and in *cachinnans*.

On the 20th of April, 1883, I observed for the first time, among numerous *L. glaucescens* on the reef at Staraja Gavan, eastern shore of Bering Island, a few gulls of about the same size, but with the tips of the wings black, and the mantle dark, almost blackish. Four days later I met a couple of birds on the western shore, near the village, and on May 2 and 5, I observed them at the same place, the latter date some twelve to twenty individuals, partly in company with *glaucescens*, partly by themselves. The same day the specimen described above was obtained. They were not seen on the island since, and were in fact, unknown to the natives, so that it is safe to say that this species only visits the Commander Island occasionally, inasmuch as a "Tschaika" with blackish back is wholly unknown to the inhabitants of Copper Island also.

When I arrived at Petropaulski, Kamtschatka, on the 14th of May, 1883, I found the same species pretty common on the ice, covering the lake, or rather lagoon, to the north of the town, but as the ice was very dangerous, the birds were either out of range, or if shot, impossible to get at. Two were obtained, however, but being too badly damaged to be preserved, only notes of the colors were taken. The color of the feet of the living bird was also observed through a powerful binocular, and noted, being in all cases the same uniform pinkish flesh color.

From the inhabitants I learned that this bird breeds at Babuschkin Kamen, in the Bay of Avatscha, and on Staritskof Island, south of the entrance to that bay.

Two additional specimens have been received since the above was written, an adult (U. S. Nat. Mus., No. 101665) and a young changing into the adult plumage (No. 101666), both from Petropaulski. The mantle is slightly lighter than that of the type specimen, but otherwise they agree. The feet are now dark pink, and have evidently been pinkish flesh color in life, as were all the birds of the species I have seen. This character at once distinguishes *L. schistisagus* from *L. affinis*, which is said to have the feet yellow, and also from *L. marinus*, in which the flesh color is very pale and rather grayish.

In the following the first measurement is that of the adult bird (No. 101665), the second one that of the young (No. 101666); length of wing is not given, as both birds are moulting the primaries:

	Millimeters.
Tail-feathers	163–180
Chord of culmen	58– 56
Bill along gape	79– 83
From nostrils	28– 27
Height at fore border of nostrils	20– 22
Tarsus	69– 76

18. Larus kamtschatchensis (Bonap.).

1826.—*Larus niveus* Pall., Zoogr. Ross. As., II, p. 320 (*nec* Bodd., 1783, qui *Gavia alba* Gunn.).—Bonap., Consp. Av., II, p. 224 (1856).—Whitely, Ibis, 1869, p. 210.—Blakist. & Pryer, Tr. As. Soc. Jap., VIII, 1880, p. 189 (*part*).—*Iid.*, *ibid.*, X, 1882, p. 104.—Taczan., Bull. Soc. Zool. France, 1883, p. 341.

1854.—*Gavina kamtschatschensis* Bonap., Naumannia, 1854, p. 215 (cfr. *Id.*, Consp. Av., II, p. 224, and Rev. & Mag., 1857, Extr. No. 2, p. 10).

1878.—*Larus delawarensis* Saunders, P. Z. S., 1878, p. 176 (*part; nec* Ord).—Seeb., Ibis, 1879, p. 24.—Blakist. & Pryer, Tr. As. Soc. Jap., X, 1882, p. 104.—Blakist., Amend. List B. Jap., p. 20 (1884).

1878.—? *Larus californicus* Saunders, P. Z. S., 1878, p. 175 (*part; nec* Lawr.).—Seeb., Ibis. 1879, p. 24.

I cannot help thinking that Pallas's *Larus niveus* really belongs here, having nothing to do with either *canus* or with *californicus*. Notwithstanding the fact that the name is preoccupied, the question of the identity af Pallas's bird is of real importance.

In the first place I concur unconditionally with Mr. Saunders (P. Z. S., 1878, p. 175) in the view that Pallas's *niveus* is something entirely different from *canus*, his remarks so far being quite conclusive. I also feel convinced that Mr. Saunders was right in referring the Japanese specimen to Pallas's bird, but I do not believe that either of them are correctly placed with *L. californicus* LAWR.

Both on Bering Island and Kamtschatka I collected a sea gull which corresponds so closely with Pallas's *niveus* as to leave no doubt in my mind that here at last is the bird to which belongs that most unfortunate name. A careful comparison of my specimens with numerous examples of *canus*, *brachyrhynchus*, *californicus* and *delawarensis* proves conclusively that they are more closely related to the last-named species than to any of the foregoing; but although evidently the Asiatic representative of *delawarensis* it is sufficiently distinct to deserve recognition by name. The future will have to decide, if it should be a trinominal. Let us hope, then, that no intergradation can be proven as *Larus delawarensis kamtschatchensis* would be an awkward appellation indeed.

This Asiatic form is in some respects intermediate between *delawarensis* and *californicus*, thus explaining how Saunders came to identify it with the latter. The color of the mantle is absolutely identical in tint and shade with that of *californicus*, consequently being considerably darker than in *delawarensis*, representing in fact a similar difference as that between *cachinnans* and *argentatus*. On the other hand, the coloration of the wing is much more like that of *delawarensis* than *californicus*, the black occupying a much larger area compared with the gray than in the latter. As to size and shape the bill differs in no way from that of *delawarensis*, but in coloration it disagrees with both the American species, the dusky ring before the tip being rather faintly indicated and fading almost completely out in the dried specimen, while in the two other species mentioned it keeps distinct for years and years.

A young bird (No. 92888, Bering Island) in transitional plumage, just assuming the bluish mantle, is in almost every respect an exact counterpart of a young *delawarensis* from Tehuantepec, Mexico, in the same state of plumage. But even in these the difference in shade of the gray of the mantle is very perceptible, while the Mexican bird has a distinct ring on the bill, hardly appreciable in the specimen from Bering Island.

According to the above, the present form may be characterized as similar to *L. delawarensis*, but with the mantle of *californicus*.

Of course, the reference of Saunders's *californicus* from Japan to the species in question is merely hypothetical, as there is as much possibility for a Californian species occasionally straggling to Japan as for a European appearing in the same manner in America. Much less doubt is felt as to the other Japanese specimen, a young bird which Saunders determined as *delawarensis*.

Pallas's name *niveus* being preoccupied we will have to look out for another name. It may possibly be Middendorff's *L. canus* var. *major* (1853), but as I have serious doubts as to the pertinency of that name, and Saunders refers it to *canus*, and not to the Eastern Asiatic form, considered by him to be *niveus* = *californicus*, the varietal name given by the great Siberian traveler may rest in peace where Saunders has left it.

In 1854 Bonaparte, speaks of a new species in the following terms: (Naumannia, 1854, p. 215) "*Gavina kamtschatchensis*, Bp., qui est la race kamtschadale du *Larus canus* L." As this is all he says about it the name is a "*nomen nudum*," and consequently not entitled to recognition. But two years later we find in Bonaparte's Conspectus Avium (II, p. 224), as also in an article in the "Revue et Magazin de Zoologie" for 1857, a statement that the name is a synonym, partially so at least of *L. niveus* PALL., and as the description and the habitat assigned fit our bird we feel no hesitation in adopting it.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wings beyond tail.	Wing.	Tail-feathers.	Chord of culmen.	Bill from nostrils.	Tarsus.	Middle toe with claw.
					mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
			1883.									
92889	2052	Petropaulski, K...	May 21	♂ ad.	512	69	378	153	44	21	59	50
92890	2728	.... do	Oct. 18	♂ ad.	......	......	350[1]	144	41	21	57	49
92880	2068	Bering Island.....	May 29	(♂)jun.	(482)	......	370	137[2]	42	20	59	50
101667	......	Petropaulski, K...	1884.	ad.	......	......	(1)	149	39	21	56	......

[1] Moulting.

[2] Very worn.

No. 92889.—Iris grayish cream color. Bill ocher-yellow tinged with olive, and with a dusky spot on both mandibles towards the tip. Naked eye-ring vermillion. Feet pale lemon-yellow with a bluish green tinge which is stronger on the joints. Testes large, swollen. Pl. vi, fig. 4.

No. 92890.—Bill pale straw-yellow, greenish gray towards the base; angle of mouth orange. Eye-ring dull reddish. Feet pale straw-yellow; webs more vivid.

The present species seems not to be common on the coast of Kamtschatka, where it probably breeds, however. The specimens procured by me were obtained in the harbor of Petropaulski in May and October, when only a few were seen at the time.

Another specimen was shot on Bering Island during my absence in Kamtschatka and preserved. It was probably only a straggler, as the species does not breed on the island.

Since the above was written, Capt. E. J. Hunter had the kindness to send me another specimen shot, in the fall of 1884, at Petropaulski. It closely resembles No. 92890, but the mantle is a shade deeper. The measurements are embodied in the table above.

19. Larus canus Lin.

1758.—*Larus canus* Lin., Syst. Nat., 10 ed., I, p. 136.—Middend., Sibir. Reise, II, 2 (p. 243) (1853).—Schrenck, Reis. Amurl., I., p. 509 (1860) (*part?*).—Swinhoe, P. Z. S., 1871, p. 420.—Saunders, P. Z. S., 1878, p. 177.—Blakist., & Pryer, Tr. As. Soc. Jap., VIII, 1880, p. 189 (*part?*).—*Iid. ibid.*, X, 1882, p. 104.—Blakist., Amend. List. B. Jap., p. 20.

A single specimen, evidently a straggler, was collected by me on Bering Island during the early part of the winter 1882. It is in every respect, color, and size a typical *canus*, being absolutely identical with a specimen from Denmark in the collection of the National Museum. In fact, I have seldom seen two members of the Larine family so alike as these two from the most extreme regions of the Palæarctic continent. The Danish bird is a trifle larger, but it may have been a male, as the sex is not given on the label.

The measurements of my specimen are as follows:

♀ *ad. U. S. Nat. Mus. No.* 92894; *L. Stejneger, No.* 1747. *Bering Island, November* 26, 1882.

Total length, 472^{mm}; wings beyond tip of tail, 30^{mm}; wing, 337^{mm}; tail-feathers, 139^{mm} (fresh, unabraded); chord of culmen, 35^{mm}; bill from nostrils, 18^{mm}; tarsus, 53^{mm}.

Iris cream color, with dark gray shadings. Bill, olive yellow, tip purer yellow; angle of mouth, orange red. Naked eye-ring, dusky red. Feet, grayish olive yellow; joints darker, somewhat bluish; webs purer yellow.

The gullet was crammed with fish spawn, several *Orchestiæ* and other *Gammaridæ*, plenty of a small, blackish-brown chrysalis of a dipterous insect common on sandy beaches, and a small fish.

20. Larus ridibundus Lin.

1766.—*Larus ridibundus* Lin., Syst. Nat., 12 ed., I, p. 225.—Nordm., in Erman's Verz. Thier. Pflanz. Reis. Erde, p. 18 (1835).—Middend., Sibir. Reis., II, 2 (p. 244) (1853).—Kittl., Denkw., II., p. 200 (1858).—Schrenck, Reis. Amurl., I., p. 510 (1860).—Radde, Reis. Süd. Ost-Sibir., II, (p. 387) (1863).—Saunders, P. Z. S., 1878, p. 200.—Blakist. & Pryer, Tr. As. Soc. Jap., VIII, 1880, p. 190.—*Iid.*, *ibid.*, X, 1882, p. 105.—Blakist., Amend. List B. Jap., p. 10 (1884).—*Chroicocephalus r.* Swinh., Ibis, 1863, p. 428.—*Id.*, *ibid.* 1874, p. 165.—*Id.*, P. Z. S., 1871, p. 421.—Blakist. & Pryer, Ibis, 1878, p. 217.—Seeb., Ibis, 1879, p. 24.

1776.—*Larus atricilla* PALL., Spicil Zool., V, p. 28 (*nec* LIN.).—*Id.*, Zoogr. Ross. As., II, p. 324 (1826).—FALCK, Reise, III (p. 354) (1786).

1820.—*Larus capistratus* TEMM., Man. d'Orn., 2 ed., II, p. 785.—*Chroicocephalus c.* SWHINH., P. Z. S., 1863, p. 326.—DYBOW. & PARVEX, J. f. Orn., 1868, p. 338.—TACZAN., J. f. Orn., 1873, p. 111.—*Id.*, *ibid.*, 1874, p. 337.—*Id.*, *ibid.*, 1875, p. 257.—*Id.*, *ibid.*, 1876, p. 202.—*Id.*, Bull. Soc. Zool. France, 1876, p. 264.—*Id.*, *ibid.*, 1882, p. 397.—*Id.*, Orn. Faun. Vost. Sibir., p. 65 (1877).

1857.—*Larus brunneicephalus?* CASSIN, Exp. Jap. Perry, II, p. 233.

Having no true *L. ridibundus* from Europe at hand I shall make no attempt, at present, at separating the eastern bird from the western. I will only point to the fact that even the smallest dimensions of my birds and of a series of specimens from Japan (together with numerous measurements in Blakiston's manuscript notes from the latter country) are considerably larger than the maximum of a series of some thirty specimens as given by Schlegel (Mus. P. B. Lari, p. 38). It was this large size which induced Cassin to regard the specimen from Japan (and I have re-examined and re-measured it and find it agree perfectly with others from the same locality and from Kamtschatka) as belonging to *brunneicephalus* JERDON. Middendorff's *L. ridibundus* var. *major* is probably the same thing. The pattern of the first three primaries is essentially the same as that given by Saunders (P. Z. S., 1878, p. 201, fig. 12), only that on the third primary at least the outer half of the light portion is a distinct and rather well-defined bluish gray of the same color as the back.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wings beyond tail.	Wing.	Tail-feathers.	Culmen.	Tarsus.	Middle toe with claw.
					mm.	mm.	mm.	mm.	mm.	mm.	mm.
92892	2595	Petropaulski	Sept. 18, 1883	♀ ad.	415	40	317	130	37	47	42
92893	2719	....do	Sept. 28, 1883	♀ ad.	......	......	*284	116	34	45	......
92891	2741	....do	Oct. 1, 1883	♀ ad.	......	......	†308	128	34	44	......

*Moulting. †To tip of second primary; the first one still growing and shorter than the second.

No. 92892.—Iris dark brown. Bill pale salmon red; tip in front of nostrils dark brownish. Feet and webs similarly colored; tarsus in front brownish gray, and toes a little more livid than the webs; nails, blackish.

No. 92893.—Bill and feet vermilion, the former somewhat dusky towards the tip.

This species occurs abundantly in the vicinity of Petropaulski, where it breeds. It was not seen on the islands during my stay there, but I was informed that a few have been observed occasionally at Lake Saranna.

21. Rissa tridactyla pollicaris STEJNEGER.

1769.—*Larus ryssa* PALL., Spicil. Zool., V, p. 28.
1826.—*Larus rissa* PALL., Zoogr. Ross. As., II, p. 321 (*nec* BRÜNN 1764.)
1832.—*Larus tridactylus* KITTL., Isis, 1832, p. 1104.—*Id.*, Denkw., I, pp. 248, 287; II, p. 225 (1858).—COINDE, Rev. Mag. Zool., 1860, p. 401.—BLAKIST. & PRYER, Ibis, 1878, p. 217.—SEEB., Ibis, 1879, p. 24.—*Id.*, *ibid.*, 1884, p. 32.—BLAKIST., Amend. List B. Jap., p. 34 (1884).—*Rissa t.* DALL & BANNIST., Tr. Chicag. Acad. I, 1869, p. 305.—FINSCH, Abh. Brem. Ver. III, 1872, p. 84.—DALL, Avif. Aleut. Isl. Unal. eastw., p. 8 (1873).—*Id.*, Avif. Aleut. Isl. west Unal., p. 9 (1874).—BLAKIST. & PRYER, Tr. As. Soc. Jap., VIII, 1880, p. 190.—*Iid.*, *ibid.*, X, 1882, p. 105.—TACZAN., Bull. Soc. Zool. France, 1883, p. 398.
1853.—*Larus* (*Rissa*) *brachyrhynchus* BRUCH, Journ. f. Orn., 1853, p. 103, sp. 31, (*nec* GOULD, 1843, *nec* RICHARDS., 1831).—*Rissa brachyrhyncha* TACZAN., Bull. Soc. Zool. France, 1876, p. 264.—*Id.*, Orn., Faun. Vost. Sibir., p. 65 (1877).
1854.—*Rissa nivea* BONAP., Naumannia, 1854, p. 212 (*nec* PALLAS, 1826, *nec* Gray, 1845).—*Larus* (*Rissa*) *niveus* BRUCH, Journ. f. Orn., 1855, p. 285, sp. 36.
1856.—*Rissa kotzebui* BONAP., Consp., Av., II, p. 226 (*nec* 1854 quæ *brevirostris* BRANDT).—STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 60.
1872.—*Larus tridactylus* var *kotzebui* COUES, Key, p. 314.—*Id.*, in Elliott's Aff. Alaska, p. 199 (1875).
1880.—*Rissa tridactyla kotzbuei* RIDGW., Pr. U. S. Nat. Mus., 1880, p. 206.—BEAN, Pr. U. S. Nat. Mus., 1882, p. 167.—NELSON, Cruise Corwin, p. 105 (1883).
1884.—*Rissa tridactyla pollicaris* STEJNEGER, in B. Br. Ridgw., Water B., II, p. 202.—TURNER, Auk, 1885, p. 158.

In the Journal für Ornithologie for 1853 (p. 103) Mr. Bruch enumerated monographically the species of the subgenus *Rissa* as follows:

30. *tridactylus* Lin. Northern coasts of the whole earth.
31. *brachyrhynchus* Gould. North America. The hind toe, however, is somewhat better developed than in the foregoing species.
32. *brevirostris* Brandt. Northwestern coast of America. The feet are bright coral-red, and the bill is yellow.

In the "Naumannia" for the following year (1854) Bonaparte reviewed Bruch's paper, and in offering his list, with the "erreurs et omissions que j'ai pu y reconnaître," he treats the *Rissæ* (p. 212) as follows:

40. tridactyla L., ex Hemisph. bor.
41. nivea Pall., ex borealib. As. or. Am. occ.
42. Kotzebuii Bp., ex Am. s. occ. Californ.

It will be seen that the differences from Bruch's enumeration are:

(1) The change of the name "*brachyrhynchus* Gould" into "*nivea* Pall."

(2) The change of the name "*brevirostris* Brandt" into "*kotzebuii* Bp." This is the first occurrence of the latter name!

(3) The habitat of the second and third species is given with more detail than in Bruch's list. When Bruch, in 1855, (Journ. f. Ornith, p. 285), presented his "Revision der Gattung Larus Lin.," he evidently

only revised his former list, availing himself of additional material and critical notes of his friends, especially of Bonaparte's.

This is also evident from an inspection of the subgenus *Rissa*, which in the "Revision" has the following aspect:

35. *tridactylus* Lin. The high North.
36. *niveus* Pall., *brachyrhynchus* Gould. Northwest coast ot America. The hind toe better developed.
37. *brevirostris* Brandt. Northwest coast of America. Also with better developed hind toe; bill, yellow; feet, coral-red.

The only changes are evidently caused by Bonaparte's criticism, and amount to—

(1) The adoption of Bonaparte's "*niveus* Pall.," and the reduction of "*brachyrhynchus* Gould" Bruch (No. 31 of the first list) to a synonym of the latter; and

(2) The designation of Northwest America as the habitat of this species.

But he does not deem it necessary to provide "*brevirostris* Brandt," with the new name *kotzebuii.*

We are now justified in concluding (*a*) that No. 30, Bruch, 1853; No. 40, Bonaparte, 1854, and No. 35, Bruch, 1855, are unquestionable synonyms; (*b*) that the same is the case with No. 31, Bruch, 1853; No. 41, Bonaparte, 1854, and No. 36, Bruch, 1855; and with (*c*) No. 32, Bruch, 1853; No. 42, Bonaparte, 1854, and No. 37, Bruch, 1855.

We are, in my opinion, further justified in concluding (*d*) that Bruch's "*brachyrhynchus* Gould," and Bonaparte's "*niveus* Pall." is the Pacific representative of the Atlantic *tridactyla* with a somewhat better developed hind toe.

It will be seen that "*brevirostris* Brandt" Bruch, with yellow bill and coral-red feet is the one upon which Bonaparte originally bestowed the name *kotzebuii.* That this view is absolutely correct is proved by Bonaparte's own words on p. 217 of the same article (Naum. 1854*), where he says: " * * * ne vaudrait-il pas mieux appeler *Kotzebui* * * * la bonne espèce des côtes Nord-ouest de l'Amérique à laquelle on applique le nom plus que douteux de *brevirostris*, Brandt;" that is: "Would it not be better to give the name *kotzebui* to that good species from the northwest coast of America, to which has been applied the more than doubtful name *brevirostris* Brandt." That Bonaparte by "on" means Bruch cannot be doubted.

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* Reprinted in his paper entitled "Notes sur les Larides," in Rev. et Mag. de Zool., 1854, p. 10.

It was only two years after that Bonaparte (Consp. Avium, II, p. 226) transferred the name *kotzebui* to the black-legged representative of *tridactyla* in the Pacific.

The above conclusions were made under the supposition that "No. 31, *brachyrhynchus* Gould," of Bruch, 1853, is not the true *brachyrhynchus* of Gould (which is the red-legged *brevirostris* Brandt, with the red color of the legs faded into yellow), but the black-legged Pacific representation of *R. tridactyla.*

Somebody might, however, advocate that Bruch's *brachyrhynchus* ought to be considered the same as Gould's species, as nothing in the short diagnosis really contradicts such an opinion. It might be said, with all probability of being correct, that Bruch was under the same impression as was Dr. Otto Finsch still in 1872,* viz., that *R. tridactyla* proper is an inhabitant of the whole northern hemisphere, and that in the Northern Pacific two other *Rissæ* occur, besides, one with yellow legs (*brachyrhynchus* GOULD), another with red legs (*brevirostris* BRANDT). This being the case, Bonaparte's "41 nivea Pall." would also become a synonym of the true *brachyrhynchus* Gould. In defense of this opinion might be quoted Bonaparte's Conspectus Avium, in which he indeed gives his No. 41 as a synonym of *brachyrhynchus* =*brevirostris*, then for the first time properly located and understood.

This theory, if correct, would make no change in the results, above arrived at, as it would only prove that both Bruch and Bonaparte were wholly unacquainted with the North Pacific Kittiwake up to 1856, that their numbers, 31, 32, and 41, 42, were identical, and, consequently, *kotzebuii*, 1854, the synonym of *brevirostris* BRANDT.

As *Rissa kotzebui* Bp., 1856, is proved to be preoccupied, this subspecies is left without a name. I, therefore, have proposed to call it *Rissa tridactyla pollicaris.* Were it not for the inconstancy of the character derived from the greater or lesser development of the hind toe, the two forms would have to stand as distinct species. As the case is now, they can only be recognized as subspecies. It may, however, be mentioned that the Pacific form does not differ only in the development of the hind toe, as the black tips of the first primaries are longer, and the bill, on the average, longer and differently shaped than in the Atlantic bird. Besides, I have been unable to find in any specimen of a large series of *pollicaris* the black of the tips of the second and third primaries running down along the edge of the outer web.

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*Abhandl. Brem. Ver., III, 1872, pp. 84, 85, sps. 107, 108, 109.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Culmen.	Tarsus.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
92895	2090	Bering Island	May 25, 1883	(♂) ad.	(445)	325	134	39	36
89124	1200	do	June 13, 1882	♀ ad.	450	298	139	39	36
92896	2638	Staritskoff Island, Kamtschatka	Sept. 23, 1883	juv.	.....	318	128	32	33
92897	2637	do	Sept. 23, 1883	juv.	.....	.....	.....	.....	.....

No. 89124.—Iris dark brown. Bill clear yellow, in front of nostrils tinged with apple-green; tip whitish; angle of mouth and the interior of the gape deep orange-red; eye-ring vermilion. Feet blackish brown, on the outside darker, brownish black; naked part of tibia on the inner side bright orange-yellow, as are also one or two irregular spots on the inner corner of the web between middle and inner toe.

The Pacific Kittiwake, called by the natives "*Gavaruschka*," on account of its loquacity, is a common breeding bird, both on the islands and along the Kamtschatkan coast, but as all places do not suit these noisy birds or supply all their requirements the rookeries are comparatively few, a compensation for which is found in the astonishing number of individuals inhabiting each rookery. For such are chosen steep walls, rising perpendicularly out of the deep sea, and especially high pinnacles standing lonely amidst the foaming breakers, provided they are fitted out with shelves and projections upon which to place the nests.

As Copper Island offers such localities all around its shore, the Kittiwake is pretty well distributed all over that island. On Bering Island, on the other hand, only the southern part has suitable rookeries, but here the red-legged Gavaruschka excludes it from Cape Manatee to Peregrobnij. The first rookery of any importance on the western shore is among the cliffs of Dikij Mys.

The only rookery I had the opportunity of visiting on the coast of Kamtschatka is situated on a pinnacle-shaped rock, called the sentinel (Tschasovoj), close to the island *south* of the entrance to Avatscha Bay, called Staritskoff Island. It is the same visited by v. Kittlitz, more than half a century ago, and as I have nothing to add to his interesting account (Denkw., II, p. 214, seqv.), I shall only remark that I found the Kittiwake as numerous at the present time as it was on the day when he lost his gun on the "Tschasovoj."

To Bering Island they arrived in 1883, about the 1st of April, when flocks were observed at Tolstoj Mys. I found the first young ones hatched on Copper Island, August 2, 1883.

22. **Rissa brevirostris** (Bruch).

1843.—*Larus brachyrhynchus* Gould, P. Z. S., 1843, p. 106 (*nec* Richards., 1831); *Id.*, Zool. Voy. Sulphur, p. 50, pl. 34 (1844).—Finsch, Abh. Brem. Ver., III, 1872, p. 84.

1845.—*Rissa nivea* Gray, Gen. Birds, III, p. 655 (*nec* Pall.).

1853.—*L[arus] brevirostris** Bruch, Journ. f. Ornith., 1853, p. 103, sp. 32.—Coues, in Elliott's Aff. Alaska, p. 199 (1875).—Elliott, Monogr. Seal Isl., p. 133 (1882).—*Rissa brevirostris* Lawrence, in Baird's Birds of N. Amer., p. 855.—Dall & Bannist., Tr. Chicag. Acad., I, 1869, p. 305.—Finsch, Abh. Brem., Ver., III, 1872, p. 85.—Dall., Avif. Aleut. Isl. Unal. east, p. 8 (1873).—Nelson, Cruise Corwin, p. 105 (1883).—Stejneger, Pr. U. S. Nat. Mus., 1883, p. 60.—*Id.*, Auk, 1884, p. 358.—Turner, Auk, 1885, p. 158.

1854.—*Rissa kotzebuii Bonap.*, Naumannia, 1854, p. 212, (*nec* 1856).

1860.—*Larus warneki* Coinde, Rev. Mag. Zool., 1860, p. 401.

My specimen is absolutely identical with those from the Prybiloff group.

The Red-legged Kittiwake—Krasno-nogaja Gavaruschka—is in every respect, both structurally and in its habits, a true *Rissa.* Like its black-legged cousin, it only selects steep and inaccessible rocks, and in none of its habits at the breeding-place could I detect any marked difference. They also arrive at the islands about the same time, hatching their young simultaneously with the other species. Those birds which are not engaged in breeding do not seem to straggle about to such an extent, however, as do the black-legged ones, and in fact I never saw a red-legged Kittiwake at any season on the northern part of Bering Island.

The two species usually keep apart from each other. In the great rookery at Dikij Mys only one solitary red-legged bird was seen among the thousands and thousands of black-feet, while a still greater colony at Gavaruschkaja Buchta consisted of red-legs exclusively. "*R. kotzebui* [= *R. pollicaris*] was observed in countless numbers along the western shore; but as soon as we had doubled Cape Manatee we met as large or still larger flocks of *R. brevirostris*, among which not a single black-legged individual could be detected. * * * And thus the red-legged form completely excluded the other along the eastern shore." (Pr. U. S. Nat. Mus., 1883, p. 60.)

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* One will almost invariably find quoted "*Rissa brevirostris* Bruch." He, however, regarded the names "*Rissa*," "*Gabianus*," "*Dominicanus*," "*Glaucus*," &c., as subgeneric terms (he calls the groups "Familie," not genus), not to be included in the name. In his two monographs nowhere will be found the specific name connected with the subgeneric, but invariably by an "*L.*" as an abbreviation for *Larus*. See *L. leucopterus*, *L. glacialis*, *L. consul*, *L. glaucopterus*, under *Glaucus*; *L. Hartlaubii* under *Gavia*; *L. tridactylus* under *Rissa*, &c. His own direct remarks (J. f. Orn., 1855, p. 274) are to the same effect and are absolutely conclusive.

On Copper Island, however, I found the two species breeding together on the same rocky wall—the black-feet always higher up than the present species. The two kinds were easily distinguished when sitting on the nests, *brevirostris* having the gray of the mantle of a perceptibly darker shade than *pollicaris*.

Only one specimen was brought home. Quite a series, however, was procured at Tolstoj Mys, Bering Island, on the 27th of August, but the terrible storm of wind and rain which we encountered in the afternoon, and which lasted for three days, spoiled the specimens and made preparation impossible. We had enough to do in taking care of the boat, the tent, guns, and collections already prepared.

The measurements of this specimen are as follows:

Ad., U. S. Nat. Mus. No. 89125; *L. Stejneger No.* 1488. *Dikij Mys, Bering Island, August* 23, 1882.

Total length, 402^{mm}; wing, 324^{mm}; tail-feathers, 132^{mm}; culmen, 29^{mm}; tarsus, 33^{mm}.

Iris dark brown. Bill lemon yellow, greenish towards tip; angle of mouth and interior of gape orange-red. Naked eye-ring and feet vermilion red.

It may be well to state here that the color of the feet in the fresh bird during the summer is pure vermilion, and not orange-red, as often given (as by Mr. H. Saunders, P. Z. S., 1878, p. 165). In the dried skin the red color soon changes to orange-red, and later to a yellowish-drab, as in the figure of Gould's *brachyrhynchus* (*l. c.*). There are not two species, one with yellow legs and another with red ones, as supposed by Dr. Finsch (*l. c.*).

23. Sterna camtschatica Pall.

1826.—*Sterna camtschatica* Pall., Zoogr. Rosso-Asiat., II, p. 335 (*nec* Finsch, Abh. Naturw. Ver. Bremen, III, p. 85 (1872) quæ. *S. aleutica* Baird).—Kittl., Denkw., I, p. 322, and II, p. 200 (1858).—Taczanowski, Bull. Soc. Zool. France, 1876, p. 362.—*Id.*, Orn. Faun. Vost. Sibir., p. 63 (1877).—Stejneger, Naturen, 1884, p. 8.

1835.—*Sterna longipennis* Nordm. in Ermann's, Verz. Thier. Pflanz., p. 17 (*nec* Finsch, J. f. Orn., 1867, p. 339, quæ *S. frontalis* Gray; *nec* Coues, Key, p. 321 (1872), quæ *S. paradisæa* Brünn.).—Middend., Sibir. Reise, II, 2 (p. 246, tab. 25, fig. 4), (1853).—Schrenck, Reise Amur-Lande, I, p. 512 (1860).—Radde, Reis. Süden Ost-Sibir., II (p. 389), (1863).—Swinhoe. P. Z. S., 1863, p. 329.—Schlegel, Mus. Pays-Bas, Sternae, p. 23 (1864).—Blasius, J. f. Orn., 1866, p. 80.—E. v. Homey., J. f. Orn., 1870, p. 439.—Przewalski, Putesch. Ussur. Supp. (n. 223), (1870).—Hartlaub & Finsch, J. f. Orn., 1872, p. 112.—Taczan., J. f. Orn., 1873, p. 111.—*Id.*, *ibid.*, 1874, p. 337.—*Id.*, *ibid.*, 1875, p. 257.—*Id.*, *ibid.*, 1876, p. 202.—*Id.*, Bull. Soc. Zool. France, 1876, p. 261.—*Id.*, *ibid.*, 1882, p. 397.—*Id.*, Orn. Faun. Vost. Sibir., p. 62 (1877).—SAUNDERS, P. Z. S., 1876, p. 650.—SEEBOHM, Ibis, 1879, p. 23.—*Id.*, *ibid.*, 1880, p. 194.—FINSCH, P. Z. S., 1879, p. 15.—*Id.*, Ibis, 1881, p. 540.—BLAKIST. & PRYER, Tr. Asiat. Soc. Japan, VIII, 1880, p. 188.—*Iid.*, *ibid.*, X, 1882. p. 103.—STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 70 (*part*), Ibis, 1883, p. 582.—*Id.*, Naturen, 1884, p. 8.—BLAKIST., Amend. List B. Jap., p. 10 (1884),

1858.—*Sterna glacialis* KITTLITZ, Denkw. Reise, I, p. 322.

Dr. Otto Finsch has most erroneously identified Baird's *aleutica* with Pallas's *camtschatica*, thus extending the range of the former species so as to embrace both the American and the Asiatic shores of the North Pacific, while it really is of a very limited distribution on the American side only. Finsch's identification was evidently made from the descriptions only, he having never seen a specimen of the true *aleutica*; but an actual comparison of my Kamtschatkan birds with a large number of *Sterna aleutica* proves, beyond doubt, that the two species are perfectly distinct, not only in color but also in proportions. In fact, Hartlaub and Finsch were perfectly correct (Orn. Centr. Polynes., p. 220) when referring Pallas's *camtschatica* to *longipennis*.

The difference in coloration between the latter and *S. aleutica* is chiefly the uniform black forehead, crown, and nape, while *aleutica* in full breeding summer plumage has the forehead and a superciliary stripe pure white. The size is about the same, but the proportions of bill and feet are rather different. In *aleutica* the bill on the average is shorter, the tarsus also shorter, but the middle toe very considerably longer. This character is very conspicuous, and will serve to distinguish the two species in all plumages.

That Nordmann's *longipennis* is the same as Pallas's *camtschatica* can hardly be doubted. When considering the description given by the latter we must remember that he had not seen the bird himself, Steller's manuscript notes being his only source, and that the measurements are evidently wrong, probably belonging to some other bird. The dimensions "*caudæ* 3″" and "*digiti medii* 1″ 7‴" are, of course, not more correct than "5‴" are correct for the tail of *Sterna caspia*, as given on a previous page. "*Rostrum nigrum*," "*Color fere St. Hirundinis*" and "*Pedes fusco-rubri*" fit the Kamtschatkan "Martischka," as it is still called by the natives (cfr. "Larus Martyschka, Steller MS."), so well as to allow no doubt as to what bird is meant.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wings beyond tail.	Wings.	Tail-feathers.	Culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92898	2055	Avatscha, Kam......	May 24, 1883	♀ ad.	350	22	274	149	33	22	28
92900	2073	Bering Island.......	May 27, 1883	(♀) ad.	(370)	......	254	161	31	21	23
92899	2192	....do..................	June 21, 1883	♀ ad.	348	29	279	146	36	22	23
101670	......	Petropaulski, Kam..	1884	jun.	......	......	260	113	30	21	22
101671	......	....do..................	1884	jun.	......	......	255	115	28	20	......

No. 92898.—Iris very dark brown. Bill black. Feet blackish red. Diameter of largest egg in ovary 5^{mm}. Very fat.

No. 92899.—Iris dark brown. Bill black, with a reddish tinge shining through in front of the nostrils, on the gonys at base of upper mandible, and at the angle of the mouth; the extreme tip whitish. Feet dark reddish brown. Eggs in the ovary, swollen, but small. Lesn.

As already stated in my preliminary report, the Kamtschatkan Tern occurs on Bering Island, but I was wrong in giving it as breeding there. The four pairs of terns stated to have bred there I found out the next year to belong to the following species (*S. paradisæa* BRÜNN).

In Kamtschatka I met this species in the middle of May, 1883, at the mouths of the rivers falling into the Bay of Avatscha, but they were not very numerous. During my visit in the autumn I saw but once a large flock, about the first of October, in the Rakovaja Guba, Avatscha Bay.

Since the above was written Capt. E. I. Hunter had the kindness to send me two birds of the year, collected at Petropaulski. The structural differences pointed out above will serve equally well for distinguishing the young. The measurements are embodied in the table above.

24. Sterna paradisæa BRÜNN.

1764.—*Sterna paradisæa* BRÜNN., Orn. Bor., p. 46 (*nec* KEYS. & BLAS., 1840 quæ *dougalli*).—TURNER, Auk, 1885, p. 158.

1819.—*Sterna macrura* NAUMANN, Isis 1819 (p. 1847).—DALL & BANNIST., Tr. Chic. Acad. I. 1869, p. 306.—DALL, Avif. Aleut. Isl. Unalasch. eastw., p. 10 (1873).—*Id.*, Avif. Aleut. Isl. west Unalasch., p. 9 (1874).—NELSON, Cruise Corwin, p. 109 (1883).

1820.—*Sterna arctica* TEMM., Man. d' Orn., 2 ed., I., p. 742.—PALMÉN, Spec. Cat. Swed. Lond. Fish. Exhib., 1883, p. 202.

1883.—*Sterna longipennis* STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 70 (*part. nec* NORDM.).

The Arctic Tern occurs and breeds in small number on Bering Island. In 1882 only four pairs were observed. They breed at the great lake a few miles to the east of the village.

There are but few authentic records of the occurrence of this species in the eastern parts of Asia. Middendorff quotes it from Taimyr and Radde from the delta of the Upper Angara, but later travelers have not found it there. Swinhoe did not obtain it in China, nor has it been found in Japan, the Amur-province, the Kuriles, the shores of the Okotsk Sea, or Kamtschatka. Mr. Nelson, however, (Cruise Corwin, p. 109) noted it on the northeastern Siberian coast of the Arctic Ocean and Nordenskjöld collected a specimen there, at Pitlekaj, July 5, 1879. The species has been found on several of the Aleutian Islands belonging to America.

The specimen collected by me measures:

♂ *ad., U. S. Nat. Mus. No.* 92901; *L. Stejneger No.* 2129. ***Bering Island, June*** **5, 1883.**—Total length 371$^{\mathrm{mm}}$. Tail beyond wings, 8$^{\mathrm{mm}}$. Wing, 280$^{\mathrm{mm}}$. Tail-feathers, 185$^{\mathrm{mm}}$. Culmen, 32$^{\mathrm{mm}}$. Tarsus, 17$^{\mathrm{mm}}$. Middle toe with claw, 22$^{\mathrm{mm}}$. Iris dark brown. Bill carmine, tip slightly dusky. Feet vermilion, tinged with carmine.

Family STERCORARIIDÆ.

25. Stercorarius parasiticus (LIN.)

1758.—*Larus parasiticus* LIN., Syst. Nat., 10 ed., I, p. 136 (*nec* LESS. qui *longicaudus*).—*Stercorarius p.* DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 303.—COUES, in Elliott's Affairs Alaska, p. 196 (1875).—ELLIOTT, Monogr. Seal Isl., p. 132 (1882).—TURNER, Auk, 1885, p. 158.—*Lestris p.* DALL., Avif. Aleut. Isl. west Unal., p. 9 (1874).—TACZAN., Bull. Soc. Zool. France, 1876, p. 262.—*Id., ibid.*, 1883, p. 341.—*Id.*, Orn. Faun. Vost. Sibir., p. 64 (1877).

1773.—*Larus crepidatus* BANKS in Hawkesw., Voy. II (p. 15).—*Stercorarius c.* (?) BLAKIST. & PRYER, Tr. As. Soc. Jap. X, 1882, p. 105.—BEAN, Pr. U. S. Nat. Mus., 1882, p. 169.—NELSON, Cruise Corwin, p. 110 (1883).—BLAKIST., Amend. List B. Jap., p. 35, (1884).—SEEB., Ibis, 1884, p. 32.

1826.—*Catarractes parasita* PALL., Zoogr. Ross. As. II, p. 310.—*Lestris p.* MIDDEND., Sibir. Reis., II, 2 (p. 241) (1853).—SWINH., P. Z. S., 1863, p. 328.

On the Commander Islands the dark form is the most common. A few only with white lower surface were seen, and one secured. This species is found mostly on Bering Island where it breeds on the great tundra, or rather swamp, near the village. In 1883 the first ones made their appearance on the 4th of May. In the autumn they seem to feed to a great extent on the berries of *Empetrum nigrum*, and their excreta at that time are colored dark blue. The natives call them by the Russian name "*Rasbojnik*."

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wings beyond next longest tail feather.	Wing.	Tail-feathers.	Culmen.	Tarsus.	Middle toe with claw	Remarks.
			1882.		*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	
89083	1122	Bering Island.	May 30	♂ ad.	336+80	......	305	212	29	43	43	Dark phase.
89084	1123	....do ..	May 30	♀ ad.	420+55	......	318	200	30	44	......	Do.
89085	1411	....do ...	Aug. 7	♀ ad.	410+65	......	326	191	31	44	43	Do.
89086	1412	....do ...	Aug. 7	♀ ad.	420+70	......	322	202	29	43	43	Do.
			1883.									
92902	2162	....do ...	June 11	♂ ad.	389+65	40	320	182	30	44	41	Light phase.

No. 89084.—Iris dark brown. Bill brownish black; more greenish gray at base of upper mandible. Feet pure black.

No. 89085.—Iris, dark hazel. Bill, horny gray; blackish at tip. Feet, black.

No. 92902.—Iris, dark brown. Bill, blackish brown, lighter brownish gray at base of lower mandible; nasal shield and culmen, still lighter. Feet, black, the left tarsus with a whitish spot in front. Testes, small.

One egg was collected on May 29, 1882 (No. 1115, U. S. Nat. Mus. No. 21799), and measures 57 by 41.25^{mm}.

26. Stercorarius longicaudus VIEILL.

1819.—*Stercorarius longicaudus* VIEILL., Nouv. Dict. d'Hist. Nat. XXXII, p. 157.—TURNER, Auk. 1885, p. 158.

1822.—*Lestris buffonii* BOIE, Isis, 1822, p. 562.—MIDDEND., Sibir. Reise, II, 2 (p. 241) (1853).—SWINH., P. Z. S., 1863, p. 328.—TACZAN., Bull. Soc. Zool. France, 1876, p. 262.—*Id.*, *ibid.*, 1883, p. 341.—*Id.*, Orn. Faun. Vost. Sibir., p. 64 (1877).—*Stercorarius b.* DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 304.—COUES, in Elliott's Affairs Alaska, p. 197 (1875).—ELLIOTT, Monogr. Seal Isl., p. 132 (1882).—BLAKIST., Amendl List B. Jap., p. 35 (1884).—SEEB., Ibis, 1884, p. 176.

1826.—*Stercorarius cepphus* STEPH., Gen. Zool. XII, i, p. 211.—*Lestris c.* PALMÉN, Swed. Cat. Lond. Fish. Exh., p. 201 (1883).

1828.—*Lestris parasitica* LESSON, Man. d'Orn., II, p. 288 (*nec* LIN.).—*Stercorarius p.* (?) BLAKIST. & PRYER, Tr. As. Soc. Jap., X, 1882, p. 105.— NELSON, Cruise Corwin, p. 111 (1883).

The Long-tailed Jæger in the adult plumage resembles very closely the light phase of the foregoing species, but even young birds of the two species may be easily distinguished.

Some stages may at once be recognized by the coloration alone. It has been given as an unfailing mark that in Richardson's Jæger the shafts of all or most of the primaries are white, while in *longicaudus* only the two first ones are so colored. Such is certainly the rule, but the examination of a very large series of both species has convinced me that all transitional stages occur, as birds are found having the two, three, four, five, or six first primaries with white shafts, and that these characters, consequently, are of little value. The coloration may be depended upon as a safe guide for the identification in the following cases:

If the bird has wholly black legs, tarsi included, then it belongs to *parasiticus* (*crepidatus*), even if light colored underneath. This character, however, is only safe when applied to rather fresh specimens, as the light tarsi often darkens so much in museum specimens that it is difficult to decide upon the original color.

If the bird is sooty all over, it is *parasiticus*.

If it has the tarsi light blue (Saunders, P. Z. S., 1876, p. 331, gives the color as yellowish olive; that is only the case in dried specimens, not in the fresh bird), simultaneously with uniformly soot-colored under wing coverts, then it certainly belongs to *longicaudus*.

In all other cases the proportions of the different parts of the bill are the only reliable characters. *S. parasiticus* is recognizable by having the gonys shorter and the nasal shield longer, while in *longicaudus* these proportions are reversed. The length of the gonys, as compared with the breadth of the bill across the points of the loral antiæ is a good character of the bird when still in the flesh, and so is the position of the angle of the gonys in its relative position to the nostrils, the former being placed much in front of the anterior border of the nostrils in *parasiticus*, while in *longicaudus* it is placed right below that same point. But museum specimens may be identified by measuring the distance from the anterior border of the nostrils to the tip of the bill and compare it with the length of the nasal shield along the culmen. In *longicaudus* the two distances are of equal length, while in *parasiticus* the nasal shield is much longer.

These characters hold good at least in birds one year old just before the second moult, and in the adults. Whether young ones in the first plumage are distinguishable in the same manner I cannot say with certainty, as I have no access to a specemen of *longicaudus* of that age, but I have little doubt that they are, as the essential characters of *parasiticus* are very well borne out in several young specimens before me.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing beyond next longest tail-feather.	Wing.	Tail-feathers.	Culmen.	Tarsus.	Middle toe with claw.
			1883.		*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92905	2127	Bering Island.......	June 5	♂ ad.	385+175	42	310	302	27	41	37
92903	2193	...do................	June 21	♂ ad.	400+120	30	310	265	27	43	38
92904	2226	Copper Island	July 3	♀ horn.	381+117	28	311	238	26	44	39

No. 92905.—Iris dark brown. Bill black. Tarsus light grayish blue; naked part of tibiæ, toes, and webs black. Stomach empty. Extremely fat.

No. 92903.—Iris dark brown. Bill blackish brown, lighter at base, and nasal shield tinged with olive. Tarsus and hind toe light grayish blue; tibiæ, toes, and webs black. Testes small. Stomach contained an *Arvicola rutila*. Rather fat.

No. 92904.—Iris dark brown. Bill blackish brown, nasal shield olive gray. Naked part of tibiæ, tarsus, and portion of toes nearest to the tarsus, light grayish blue, remainder, including hind toe, black. Eggs in ovary very small and undeveloped. In stomach only a few fish-bones.

The Long-tailed Jæger does not breed on the islands. Those which I met were only adult males or birds of the first year. I should not be surprised, however, if this species in a near future might be induced to settle on Bering Island on account of the enormous increase of *Arvicola rutila*, which has been introduced into the island within the last ten years.

Superfamily PROCELLAROIDEÆ.

Family DIOMEDEIDÆ.

27. Diomedea albatrus PALL.

1769.—*Diomedea albatrus* PALL., Spicil. Zool., V, p. 28.—*Id.*, Zoogr. Ross. As., II, p. 308 (1826).—SWINH., Ibis, 1864, p. 423.—SEEB., Ibis 1884, p. 176.—TURNER, Auk, 1885, p. 158.

1820.—*Diomedea chinensis* TEMM., Man. d'Orn., 2d ed., I, p. cx.

1835.—*Diomedea brachiura* TEMM., Pl. Color., V, livr. 94, pl. 554.—TEMM. & SCHLEG., Faun. Japon. Aves (pl. 66) (1849).—KITTL., Denkw., I, pp. 234, 248.—SWINH., Ibis 1860, p. 67.—*Id.*, *ibid.*, 1863, p. 431.—*Id.*, *ibid.*, 1864, p. 423.—*Id.*, *ibid.*, 1867, p. 226.—*Id.*, *ibid.*, 1870, p. 366.—*Id.*, P. Z. S. 1863, p. 329.—*Id.*, *ibid.*, 1871, p. 422.—CASSIN, Pr. Acad. Philada., 1862, p. 326.—FINSCH, Abh. Brem. Ver. III, 1872, p. 83.—DALL, Avif. Aleut. Isl. west Unal., p. 8 (1874).—COUES, in Elliott's Aff. Alaska, p. 194 (1875).—TACZAN., J. f. Orn., 1876, p. 202.—*Id.*, Orn. Faun. Vost. Sibir, p. 65, (1877).—*Id.*, Bull., Soc. Zool. France, 1877, p. 40.—BLAKIST. & PRYER, Ibis, 1878, p. 218.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 190.—*Iid.*, *ibid.*, X, 1882, p. 106.—BEAN, Pr. U. S. Nat. Mus., 1882, p. 170.—ELLIOTT, Monogr. Seal Isl., p. 131 (1882).—NELSON, Cruise Corwin, p. 111 (1883).—BLAKIST., Amend. List B. Jap., p. 35 (1884).

Pallas's description of *Diomedea albatrus* is based upon a specimen sent from Kamtschatka to the Academy of St. Petersburg by Steller, and the description leaves no doubt whatever that it is the bird subsequently called *Diomedea brachiura;* the measurements alone are quite conclusive.

There cannot be the slightest doubt that plate 963 of "Planches Enluminures" represents the young of the present species, and as Temminck bestowed the name *chinensis* on that figure, the latter name, as given in 1820, would take the precedence over the same author's *brachiura*, which is fifteen years later, had it not been for Pallas's name.

Not having seen a specimen purporting to be Swinhoe's *derogata* I am unable to form an opinion as to its validity.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Stretch of wings.	Wing.	Tail-feathers.	Chord of culmen.	Tarsus.	Middle toe with claw.
			1882.		*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92906	1660	Bering Island..........	Sept. 21	♂ ad.	925	2370	575	147	131	98	136
92907	1225	Copper Island..........	June 22	jun.	870	......	560	144	132	105	......

No. 92906.—Bill reddish violet; nail whitish. Feet grayish blue with dusky on the joints and webs.

No. 92907.—Iris dark brown. Bill violet flesh color; nail more bluish white. Feet as the bill, only somewhat tinged with brownish gray. Sexual organs undeveloped.

The Albatros—by which name it is known to the natives also—by no means is a rare visitor to the Commander Islands, where I never saw *D. nigripes* AUD., a species which, on our northward voyage from San Francisco, left us before we reached the Aleutian Chain. They do not remain near the islands during the winter—at least I saw none—but the first ones were observed as early as the middle of March. These were old birds in the white plumage, and on April 14th not less than eight were seen at one time near the village. During the summer, however, the black young birds of the foregoing year are more numerous than the adults, of which a few remain all summer, though without breeding, of course. In the middle of the immense flocks of *Lunda*, *Fratercula*, and *Fulmarus*, which in quiet weather rest on the surface of the sea, covering many acres, can always be seen one or two of these comparatively gigantic dark birds, which, however, are the first ones to take the wing at the approach of a boat or a bajdarka. This species is remarkably shyer than *D. nigripes*.

I also saw it in Kamtschatka, on the Bay of Avatscha, and suspect that it is a young bird of this species which has been reported by Mr. Taczanowski under the name of *nigripes* AUD. as having been taken in Kamtschatka.

Family PROCELLARIDÆ.

28. Fulmarus glacialis glupischa STEJNEGER.

1769.—*Procellaria glacialis* PALL., Spicil. Zool., V. p. 28.—*Id.*, Zoogr. Ross. As., II, p 312 (*nec* LIN.) (1826).—SCHRENCK, Reis. Amurl., I, p. 517 (1860).—TACZAN., Bull. Soc. Zool. France, 1877, p. 40.—*Id.*, Orn. Faun. Vost. Sibir., p. 65 (1877).—*Fulmarus g.* BLAKIST. & PRYER, Ibis, 1878, p. 218.—SEEB., Ibis, 1879, p. 25.

1838.—*Procellaria pacifica* AUDUB., Orn. Biogr. V (p. 331) (*nec* GMEL., 1788).—TACZAN., Bull. Soc. Zool. France, 1882, p. 398.—*Fulmarus p.* CASSIN, Pr. Philada. Acad., 1862, p. 327.—BLAKIST. & PRYER, Tr. As. Soc. Jap., VIII, 1880, p. 190.—*Iid.*, *ibid.*, X, 1882, p. 106.—BLAKIST., Amend. List B. Jap., p. 21 (1884).

1883.—*Priocella tenuirostris* NELSON, Cruise Corwin, p. 112 (*part. nec* AUD.; cfr. STEJNEGER, Auk, 1884, p. 233).

1884.—*Fulmarus glacialis glupischa* STEJNEGER, Auk, 1884, p. 234.—TURNER, Auk, 1885, p. 158.

An examination of thirty-six specimens of arctogæan Fulmars has given the following results:

(1.) Both in the Atlantic and in the Pacific two very easily distinguishable forms occur, one almost uniform *dark* ashy or nearly sooty, the other white with pearl-blue mantle. The former is not to be confounded with the young bird of the latter, as enormous breeding colonies of the sooty form exclusively are met with. The young birds of the white forms have the head and the greater part of the lower surface suffused with light gray, yet they can never be mistaken for the dark ones, and I doubt very much if any intergradation *between the fully matured adults* of the two forms or phases can be proven. I have observed thousands and tens of thousands of the dark form breeding, not finding a single one perceptibly lighter, although a small colony of the white form was breeding in the neighborhood, but separate from the dark ones; nor were any of the light phase perceptibly darker than usual; and in no case were white and dark birds paired together.

(2.) The Atlantic and Pacific birds show hardly any—even an average—difference in the shape of the bill, the form of the nasal tubes, &c., upon which to base a separation of them, but there seems to be a decided difference in the coloration of that member. In all the birds, dark and light ones, from the Pacific the bill is light-colored, only with a little duskyon the borders of the different lamellæ and on the culmen between the nasal tubes and the nail, and the nasal tubes themselves are always light-colored, never dark, much less any other part of the bill. The reverse is the case in the different forms of the Atlantic birds, in which the nasal tubes seem to be dark-colored, and in a great many, if not all, dark-colored individuals, the whole bill has a brown color. There seems also to be a constant difference in the color of the iris of the two races, as it is given as yellow for the old Atlantic bird, while in the Pacific variety it is invariably dark brown, although it should be stated that Faber describes the Icelandic birds as having the irides "*nigro fusci.*"

The accounts of the exact colors of the light parts of the bill in the Atlantic birds are very uncertain and unsatisfactory. In the Pacific race I found two very different styles of color of the bill. All those which I examined at the breeding places, whether dark or white, had a whitish bill with faint bluish, greenish, and pinkish shades, consequently a kind of mother-of-pearl color. A faithful picture was prepared by me from a fresh specimen and is reproduced as fig. 2, on pl. vi, giving an exact representation of the color as it was invariably found in the adult breeding birds from early spring until August, at least, when I observed the last ones. The other style is represented in fig. 1, pl. vi, also colored from the fresh specimen, an old white bird from Bering Island, obtained in February. The bill is absolutely yellow with tinges of greenish and orange brownish. As this was the only winter bird I got, I cannot say whether this difference in the colors of the bill is due to season, but I really suspect it is, as I saw none among the thousands and thousands of summer birds with yellow bill, although I had excellent opportunity for observation, and I paid a special and careful attention to the subject, as will be seen. Most of the Atlantic observers record the color of the bill as yellow; is that not due to the fact that they had winter specimens before them? Faber, one of the most conscientious observers, describes the color of the bill of the Icelandic bird (in summer plumage, as he only got a few winter specimens) as being "grisescens, dertro adunco flavescenti. * * * nares * * * nigræ." (Beytr. Arct. Zool., II, Isis, 1824, p. 786), which seems to confirm my opinion of a seasonal change in the color of the bill, as Naumann, a not less careful observer, describes the bill of the old bird as beautiful and rich yellow with the nasal tubes slaty black, he having probably had only winter birds taken off the coast of Germany (Naturg. Vög. Deutschl., X, p. 594: "Der Schnabel * * * an seinem grossen Haken und dem Spitzentheil des Unterschnabels sehr schön hochgelb, ins Orangefarbene spielend, der übrige Theil, welchen die dunkele Längenfurche an der Seite in zwei gleiche Hälften zu theilen scheint, blaszgelb, der hintere Theil des Oberschnabels nur der Schneide entlang hochgelb, nach oben blasser, hier vom Schieferschwarz der Nasenröhre * * * begrenzt. * * *" Cfr. also Kumlien's description of the bill of the white phase "during the latter part of August, September, and fore part of October": "bright yellow bill," Bull. U. S. Nat. Mus., No. 15, p. 101.)

(3.) While the white phases of the Atlantic and the Pacific races are indistinguishable as far as the coloration of the feathering is concerned, the dark phases are very readily distinguished, the Pacific one being much darker all over. Its color is a saturated, plumbeous ash, more or less tinged with sooty brown (in Museum specimen the color soon turns brownish all over on account of the oxydation of the fatty matter, I suppose). The dark phase of the Atlantic bird is somewhat lighter and of a more ashy hue. Both forms have, when alive, or freshly killed, a tender, silky, olive-greenish gloss on the mantle as described by Mr. Kumlien (Bull. U. S. Nat. Mus., No. 15, p. 101) in the Atlantic race, and also observed by me in the birds of the Commander Islands.

(4.) There seems to be a decided difference in the geographical range of the two phases in both oceans; it appears that the dark phase in both instances is a particularly western bird, while the light colored ones seem to have a more eastern distribution.

If the dark form had occurred breeding in Iceland, where Faber found the white one exceedingly numerous, he could scarcely have escaped mentioning it. Nor does it seem to have been found in Saint Kilda* by John Macgillivray, and the form, at present, breeding on the Fær Islands seems also to be the unmixed light phase; in fact, I do not think the dark form has been found breeding in any number before in Davis's Straits and adjacent waters, where it occurs in great abundance. In the Pacific a similar distribution obtains, the dark form being comparatively scarce on the American side, while it is by far the predominating form on the Asiatic shore, at least as far south as Kamtschatka. The dark phase was found by me on the Commander Islands in countless

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*From Mr. Dixon's interesting account of "The Ornithology of Saint Kilda," published in the Ibis for 1885, pp. 69, *seqv.*, received since the above was written, it is learned that the "natives assert that there are two kinds, a light and a dark one, but the latter is rare." This substantiates my view as to the scarcity of the dark form in the east. On p. 94 Mr. Dixon has published a condensed account of the conclusions I have arrived at, and which I communicated to Mr. Seebohm during his visit in Washington last autumn.

numbers. In the colonies breeding on Bering Island not a single light bird was to be seen, and the same was the case at the rookeries on the northern part of Copper Island, for example, that close to the village. At Glinka, near the southern extremity of the latter island, were found a few small white colonies, but the percentage of the light-colored birds was quite trifling, as I estimated it to be between 1 and 5 per cent. The accounts of the birds taken in Kamtschatka and the Kurile Islands are exceedingly meager, but indicate the dark phase as far as they go.

(5.) In the Atlantic occurs a smaller race, *F. glacialis minor* KJÆRB., besides the typical *F. glacialis*, which also has two phases. In the Pacific another race occurs, which is fairly distinguishable from *F. glacialis glupischa*, viz, *F. g. rodgersii*, characterized by its pale color and the great amount of white. The latter seems to be a northern form, apparently without any dark phase.

The question now arises as to the real nature of the two phases. A name is easily found and we may take our refuge under the shelter of "dichromatism." This does not solve the question, however, which is a most interesting one. What is dichromatism, its causes, its nature? We have one kind in raptorial birds, especially the owls, another among the herons; a third kind is that of *Stercorarius parasiticus*, and we may in this connection also quote the Arctic Fox (*Vulpes lagopus*), besides many other cases, but only future studies of the living birds will enable us to obtain satisfactory results.

List of specimens collected.

WHITE PHASE.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wings beyond tail.	Wing.	Tail-feathers.	Chord of culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92908	1900	Bering Island	Feb. 7, 1883	♂ ad.	471	22	320	117	36	52	......
92909	2267	Copper Island.......	July 14, 1883	♀ ad.	458	27	328	122	36	51	......

DARK PHASE.

89138	1212	Copper Island.......	June 8, 1882	♀ ad.	425	312	312	120	35	.....	62
92910	2008	Bering Island	May 4, 1883	....	......	......	330	132	36	50	65
92911	2233	Copper Island.......	July 5, 1883	♂ ad.	480	15	333	131	37	51	67

No. 92908.—Iris dark brown. Bill light greenish lemon-yellow, the middle of each piece or lamella orange brownish, and the edges blackish: along tomia of lower mandible and chin-angle flesh-color. Eye-ring dark brownish gray. Feet whitish with a faint greenish tinge; joints, tarsus behind and toes below, outer web and anterior border of inner web blackish brown; nails horny white. Stomach filled with feathers. Exceedingly lean.

No. 92909.—Iris dark brown. Bill whitish, tinged with flesh-color and without dusky on the sutures; nail tinged faintly with yellowish. Feet very light and pure whitish flesh-color, without any trace of dusky above or below, and without trace of any bluish or greenish tinge; joints more reddish; nails light horny brownish.

No. 89138.—Iris dark brown. Bill greenish white, with the sutures and the space between the nostril and the nail, as also the tip of the latter, blackish. Feet dirty white with a faint greenish blue tinge; the joints and the outside of the tarsus, as also the webs, except the base, blackish; tarsus behind and toes below black.

No. 92910.—Bill whitish with a faint tinge of greenish blue and yellowish, here and there with a light rosy shade; sutures and terminal part of nail blackish. Feet whitish with a faint greenish tinge; webs of the same color, their outer edge being narrowly bordered by black; along hind side of tarsus and under side of toes only trace of blackish.

No. 92911.—Iris dark brown. Bill exactly as the colored drawing of No. 2008 (the foregoing, pl. vi, fig. 12), only that the dusky on the lower mandible forms a continuous line between the nail and the malar apex. Feet whitish with a wash of bluish flesh-color, with brownish on the joints, and the fore border of the webs blackish; tarsus behind and toes below dark brownish gray. Very fat.

The "Glupisch" is one of the commonest summer visitors to the islands, and breeds in enormous numbers in suitable places, that is to say, in high and steep rocky bluffs and promontories boldly rising out of the sea 300 to 800 feet high, and I have spent hours under their rookeries listening to their whinnying voice and watching their high and elegant flight in sailing out and in and around the cracked rocks like bees at an immense bee-hive. I have mentioned above that nearly all the birds belonged to the dark phase, and that only a very small percentage of white birds breed, apart from the dark ones, on Copper Island.

The Fulmar is the first one of the non-resident water-birds to arrive at the rookeries in early spring, usually in March, the order of arrival being *Fulmarus*, *Uria arra*, *Lunda cirrhata*, *Fratercula corniculata*. One specimen of the white form was obtained on Bering Island, February 7, which would indicate that the advance guard had already reached the islands by that time, or else, what I am rather inclined to believe, that many of the birds pass the winter on the open ocean not so very far from the shores they inhabit in summer.

The eggs are dull white without spots, measuring as follows:

U. S. Nat. Mus. No.	Collector's No.	Locality.	Date.	Long diameter.	Short diameter.
				mm.	*mm.*
21806	2243	Copper Island	July 12, 1883	75	49
21807	2244	.....do	July 12, 1883	71.5	48.5
21808	2247	.....do	July 13, 1883	71.5	51
21809	2257	.....do	July 13, 1883	68	50
21810	2258	.....do	July 13, 1883	71.5	48.5

These eggs all belonged to birds of the dark phase.

29. Puffinus tenuirostris (TEMM.)

1769.—? *Procellaria nigra* PALL., Spicil. Zool., V., p. 28.

1826.—*Procellaria aequinoctialis* PALL., Zoogr. Ross. As., II, p. 314 (*nec* Lin.).

1836.—*Procellaria tenuirostris* TEMM., Pl. Color., V, Liv., 99, text only (*nec* Audub., 1839).—TEMM. & SCHLEG., Faun. Jap. Av. (p. 131, pl. 86), (1849).—SCHLEG., Mus. P. B. Procell., p. 27 (1863).—*Nectris. t.* CASSIN, Pr. Acad. Philada., 1862, p. 327.—DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 303.—BAIRD, Tr. Chic. Ac., I, 1869, (p. 322), pl. xxxiv, fig. 2.—*Puffinus t.* FINSCH, Verh. Brem. Ver., III, 1872, p. 83.—BLAKIST. & PRYER, Ibis, 1878 p. 218.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 191.—*Iid.*, *ibid.*, X, 1882, p. 107.—BLAKIST., Amend. List B. Jap., p. 23 (1884).—*Priocella t.* (!) NELSON, Cruise Corwin, p. 112 (1883) (*nec* AUDUBÒN!! cf. STEJNEGER, Auk, 1884, p. 233).—COUES, Auk, 1884, p. 80.

1854.—*Puffinus curilicus* LICHT., Nomencl. Mus. Berol., p. 100 (*part*).—*Procellaria c.* KITTL., Denkw., I, p. 296 (1858).

The "*Tschornij Glupisch*" is rather scarce on the islands, although I feel convinced that a few breed there. I saw a small flock on the 22d of August, 1882, at the entrance of Lissonkovaja Buchta, southern part of Bering Island, leaving the whale carcass upon which they were sitting at our approach. A specimen was obtained on Copper Island in June, 1883. It had been captured by one of the natives on the 17th of June, skinned and dried flesh side out, awaiting my arrival. I made afterwards a tolerably satisfactory (considering the circumstances) skin out of it. Its dimensions are:

U. S. Nat. Mus. No. 92912; *L. Stejneger, No.* 2209. *Karabelnij, Copper Island, June* 17, 1883. Wing 285^{mm}. Tail-feathers 91^{mm}. Chord of culmen 33^{mm}. Tarsus 54^{mm}. Middle toe with claw, 60^{mm}.

Another specimen of the Slender-billed Shearwater was secured on Bering Island by one of the natives and prepared by him for Dr. Dybowski, in 1882, before my arrival to the islands. Remarkably enough, neither Taczanowski nor Dybowski have mentioned the species in their recent catalogues of birds from that region. I had the opportunity of examining the specimen and made the following notes:

Chord of culmen 34^{mm}. Commissure 49^{mm}. From anterior border of nostrils to tip of maxilla 24^{mm}. From malar apex to tip of mandible 32^{mm}. Height of bill in front of nostrils 7.5^{mm}. Tarsus 54^{mm}. Middle toe with claw 63^{mm}. Wing 290^{mm}. Tail-feathers 92^{mm}. Graduation of tail 21^{mm}. Upper surface dark sooty brown, almost black on wing and tail feathers, lighter and more grayish below. Chin and upper throat almost whitish gray. Feet (in the dried specimen) on the outer side dark brownish, pale on the inner side, almost black below.

The specimen obtained by me is similarly colored but the chin and throat are not so light.

30. Oceanodroma leucorhoa (Vieill.).

1817.—*Procellaria leucorhoa* Vieill., N. Dict. d'Hist. Nat., XXV, p. 422.—Blakist. & Pryer, Ibis, 1878, p. 218. -*Id.*, Tr. As. Soc. Jap. VIII, 1880, p. 191.—*Id.*, *ibid.*, X, 1882, p. 106.—Blakist., Amend. List B.Jap., p. 35 (1884).—Seeb., Ibis, 1884, p. 33.—*Cymochorea l.* Nelson, Cruise Corwin, p. 113 (1883).—Turner, Auk, 1885, p. 158.

1820.—*Procellaria leachii* Temm., Man. d'Orn., 2 ed., II, p. 812.—Schrenck, Reis. Amurl., I, p. 515 (1860).—*Thalassidroma l.* Dall & Bannist., Tr. Chic. Ac., 1869, p. I, 303.—Dall., Avif. Aleut. Isl. west Unal., p. 8 (1874).—Taczan. Orn. Faun. Vost. Sibir., p. 66 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 40.

1826.—*Procellaria pelagica* Pall., Zoogr. Ross. As., I, p. 316 (*nec* Linn.).

1858.—*Thalassidroma scapulata* Kittl., Denkw., II, p. 191 (Brandt, Icon. ined. pl. iv, fig. 5).

I can find no structural character that will satisfactorily separate the species which usually have been kept apart in the two genera *Oceanodroma* and *Cymochorea*. Even the type of the latter, *leucorhoa* Vieill., comes very close to *Oceanodroma*, but still more so does *O. melania* Bp., which has the graduation of the tail fully as great as in *O. furcata*, and the outer rectrices tapering toward the tip which is just perceptibly more truncate than in the latter. This also has the notch of the truncated end of the other rectrices a trifle deeper than in typical *Cymochorea*. *O. furcata* and *C. melania* also agree in the stoutness of the bill. The tail of *furcata* is a little longer than in *leucorhoa* and *melania* as compared with the wing, the formula of which is somewhat variable, but, on the whole, identical in the three species. Even the coloration is not so radically different as might appear at first sight, for the species of *Cymochorea* are more or less washed with ashy gray, a color especially noticeable in fresh birds, while in old museum specimens the color turns brown, as I suppose, from oxydation of the fat contained in the feathers. This is a fact which should always be borne in mind when comparing old skins of water birds. The white feathers turn yellow, and the gray ones become brownish, as I have invariably found it to be the case in *Laridæ*, *Tubinares*, and *Alcidæ*.

Oceanodroma, as the older name (1852), will therefore take precedence over the younger, *Cymochorea* (1864), which can only be retained as a subgeneric term designating the group, the dominating color of which is fuliginous in contradistinction to the light ashy tint of the typical species of *Oceanodroma*.

The "*Malinka tschornaja Sturmofka*," or "small black Petrel," is on the Commander Islands only known from Copper Island, where it breeds at

Tschornij Mys, together with *O. furcata.* I was not so fortunate, however, as to obtain any specimen during my stay there, but the occurrence of the species is beyond doubt.

31. Oceanodroma furcata (Gmel.).

1788.—*Procellaria furcata* Gmel., Syst. Nat., I, p. 561.—Kittl., Denkw., II, p. 319 (1858).—Schleg., Mus. P. B. Procell., p. 3 (1863).—Blakist. & Pryer, Ibis, 1878, p. 218.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 191.—*Iid.*, *ibid.*, X, 1882, p. 106.—Blakist., Amend. List B. Jap., p. 35 (1884).—Seeb., Ibis, 1884, p. 33.—*Thalassidroma f.* Gould, Zool. Sulphur., p. 50, pl. xxxiii (1844).—Finsch, Abh. Brem. Ver., III, 1872, p. 83.—Dall, Avif. Aleut. Isl., Unal. eastw., p. 7 (1873).—*Id.*, Avif. Aleut. Isl. west Unal., p. 9 (1874).—*Oceanodroma f.* Nelson, Cruise Corwin, p. 113 (1883).—Stejneger, Naturen, 1884, p. 55.—Turner, Auk, 1885, p. 158.

1826.—*Procellaria orientalis* Pall., Zoogr. Ross. As., II, p. 315.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wings beyond tail.	Wings.	Tail-feathers.	Chord of culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89136	1196	Copper Island	—— —, 1882	....	......	......	161	97	15	26	28
92914	2132	Bering Island.......	June 7, 1883	♂ ad.	220	0	156	97	16	27	29
92915	2240	Copper Island.......	July 12, 1883	♂ ad.	232	0	159	98	15	27	29
92913	2271	....do................	July 18, 1883	♀ ad.	235	0	164	107	16	26	28

No. 92914.—Found dead on the beach. Bill and feet black. Extremely emaciated. Testes very small, undeveloped.

No. 92915.—Iris dark hazel. Bill and feet black.

No. 92913.—Iris dark hazel. Bill and feet black.

The Fork-tailed Petrel breeds on Copper Island, where it is known by the natives as the "Sturmofka." I do not know of its breeding at any place on Bering Island. On July 12, 1883, I visited the precipitous rocks of Tschornij Mys, between Karabelnij and Glinka, on the eastern side of Copper Island, where a small colony of these graceful petrels were breeding. The eggs, a single one in each nest, were deposited in deep holes in the steep basaltic rocks, 3 feet or more deep, and it was only with great difficulty that a few could be secured. The birds were taken on the nests, and in some the females, in others, the males were sitting.

The eggs, which were in different stages of incubation, are white without gloss; No. 21786 has plenty of the minutest dark specks evenly dusted over the blunt end; in No. 21785 these specks are a little larger, purplish black, and form a circlet around the blunt end, while some few lilac spots shine through from the deeper layers.

The eggs measure:

U. S. Nat. Mus. No.	Stajneger No.	Locality.	Date.	Long diameter.	Short diameter.
				mm.	*mm.*
21785	2237	Copper Island	July 12, 1883	34	26
21786	2238	......do	July 12, 1883	32.5	25
21787	2239	......do	July 12, 1883	34	26.5

ORDER GRALLÆ.

Superfamily SCOLOPACOIDEÆ.

Family CHARADRIIDÆ.

32. Hæmatopus osculans SWINH.

1826.—*Hæmatopus hypoleuca* PALL., Zool. Ross. As., II, p. 129 (*part*).

1853.—*Hæmatopus ostralegus* MIDDEND., Sibir. Reise, II, 2 (p. 213), (*nec* LIN.).—SCHRENCK, Reise Amurl., I, p. 413 (1860).—SWINH., Ibis, 1860, p. 63.—*Id.*, *ibid.*, 1861, pp. 261 and 342.—PRZEW. Putesch. Ussur. (n. 157) (1870).

1863.—*Hæmatopus longirostris* SWINH., Ibis, 1863, p. 406 (*nec* VIEILL.).—*Id.*, P. Z. S., 1863, p. 310.

1871.—*Hæmatopus osculans* SWINH., P. Z. S., 1871, p. 405.—*Id.*, Ibis, 1875, p. 129.—*Id.*, *ibid.*, 1875, p. 453.—PELZ., Ver. Zool. Bot. Ver. Wien, 1873, Extr., p. 6.—TACZAN., Bull. Soc Zool. France, 1876, p. 249.—*Id.*, *ibid.*, 1883, p. 339.—*Id.*, Orn. Faun. East Sib., p. 53 (1877).—BLAKIST. & PRYER, Ibis, 1878, p. 219.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 193.—*Iid.*, *ibid.*, X, 1882, p. 109.—SEEB., Ibis, 1879, p. 26.—BLAKIST., Amend. List B. Jap., p. 11 (1884).

The eastern Oyster-catcher is nearly related to the European species *H. ostralegus* L., and more nearly so, perhaps, to the form occurring in New Zealand and Australia, *H. longirostris* VIEILL. It has the black edgings of the upper tail coverts in common with the latter, but as to the length of the bill and the amount of white on the wing-feathers it is intermediate between both. As I have seen no intergradation, however, I shall keep these three forms apart as distinct species, although the probability is that it at last will be found necessary to apply a trinominal to the eastern bird, *H. ostralegus osculans* (SWINH.). One of my birds, No. 92884, has, in fact, the shaft of all the primaries as in *ostralegus*, but as the bird is a young one nothing can be concluded from it. On the other hand, the black on the upper tail-coverts forms two to three broad terminal cross-bars on each feather, the white interspace being strongly tinged with rusty buff. In adult birds from China I find only more or less broad black edging on these feathers, and in one specimen these are nearly obsolete, too, and so are they in an example of *longirostris* from New Zealand; but as the edges are very worn and abraded, the black may have been much more conspicuous in the fresh plumage. Further abrasion might perhaps have obliterated the black edgings altogether, a possibility to be taken into account by persons comparing these closely allied forms. I find that Naumann describes the bill of the young of the year of *H. ostralegus* as having the tip of the bill yellow. In my birds, when fresh, this part was decidedly dark, and the dusky color is still very pronounced in the dried specimens. It may also be worth stating that my examples have no whitish patch on the fore part of the neck, as is common in the European bird when young.

a^{1}. Rump white.
  b^{1}. Upper tail-coverts pure white, without black edgings; bill shorter. *H. ostralegus* LIN.
  b^{2}. Tips of upper tail-coverts edged with black; bill considerably longer.
    c^{1}. Shafts of primaries from the third white before the tip; second primary with a broad white stripe along the border of the inner web. *H. osculans* SWINH.
    c^{2}. Shafts of all the primaries wholly black; second primary without white stripe on the inner margin .... *H. longirostris* VIEILL.
a^{2}. Rump dark, of the same color as the back..................... *H. palliatus* TEMM.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Expos. culmen.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
92884	2607	Velutschka, East Kamtschatka ..	Sept. 21, 1883	♀ jun.	460	2	267	103	77
92980	2608	Saranna, East Kamtschatka	Sept. 22, 1883	♂ jun.	440	0	245	105	72

No. 92884.—Iris "raw umber." Bill orange-red; tips dusky. Naked eye-ring orange. Feet pale bluish flesh-color.

The Oyster-catcher occurs only regularly along the coast of the peninsula, where I saw specimens shot in the latter part of May, 1883. During a short trip to Velutschka and Saranna, September, 1883, we met a few families, out of which I only got two young birds on account of their extreme shyness. The Russians of Kamtschatka apply to this bird especially the name "*Petuschók*" (pl. "*Petuschki*"), a chicken, a term used for *Simorhynchus pygmæus* by the natives of Bering Island, for *Leucosticte griseonucha* by those living on the Prybiloff Islands (according

ing to H. W. Elliott), and to other birds in different parts of the vast empire where the Russian tongue is spoken.

This bird comes only as a rare visitor to the islands during the migration seasons. This is rather strange, as it inhabits the nearest coast of the mainland, and as the Komandorski group offers every favorable condition to these bright, noisy, and shy fellows. Besides, an allied species (*H. bachmani* Aud.) frequents the American islands of the Aleutian chain.

On the 19th of June, 1883, about noon, I observed two Oyster-catchers on the low sandy beach opposite the village of Bering Island. Crossing the river I followed them for more than 3 miles, but their shyness prevented me from securing a specimen. The pursuit had then to be given up, as I was compelled to return in order to attend to the meteorological observation at 3 p. m. A native hunter, whom I immediately sent out, promising him a good reward, likewise failed. They were not seen afterwards.

33. Arenaria interpres (Lin.).

1758.—*Tringa interpres* Lin., Syst. Nat., 10 ed., I, p. 148.—*Strepsilas i.* Midd., Sibir. Reise, II, 2 (p. 213) (1853).—Dyb. & Parvex, J. f. Orn., 1868, p. 337.—Dall. & Bann., Tr. Chic. Acad., 1869, I (p. 290).—Finsch, Abh. Brem. Ver., III, 1872, p. 62.—Coues, in Elliott's Aff. Alaska, p. 180 (1873).—Taczan., J. f. Orn., 1873, p. 101.—*Id.*, *ibid.*, 1874, p. 336.—*Id.*, Bull. Soc. Zool. France, 1876, p 247.—*Id.*, *ibid.*, 1883, p. 339.—*Id.*, Orn. Faun. Vost. Sibir., p. 51 (1877).—Blakist. & Pryer, Ibis, 1878, p. 219.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 193.—*Iid.*, *ibid.*, X, 1882, p. 108.—Seeb., Ibis, 1879, p. 26.—Elliott, Monogr. Seal Isl., p. 129 (1880).—Bean, Pr. U. S. Nat. Mus., 1882, p. 163.—Nelson, Cruise Corwin, p. 82 (1883).—Blakist., Amend. List B. Jap., p. 11 (1884).—*Arenaria i.* Turner, Auk, 1885, p. 157.
1810.—*Morinella collaris* Mey. & Wolf, Taschb. Deutsch. Vög., I, p. 383.—*Strepsilas c.* Kittl., Denkw., I, p. 287; II, p. 401.—Coinde, Rev. Mag., Zool, 1860, p. 400.
1826.—*Tringa oahuensis* Bloxh., Voy. Blonde, App. (p. 251).
1826.—*Charadrius cinclus* Pall., Zoogr. Ross. As., II, p. 148.

I have carefully compared my specimens with others from the Pacific and find them to agree in all essential points with birds from the Atlantic. Those from the latter in the collection of the National Museum are a trifle brighter colored, a circumstance due to the less worn state of their plumage. No foundation for even a subspecific division could be detected. *Arenaria melanocephala* is a good species.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*
89047	1081	Bering Island	May 25, 1882.	♂ ad.	234	152	62
92767	1420	...... do	Aug. 12, 1882.	♂ ad.	223	149	60
92768	2084	...... do	May 29, 1883.	(♂) ad.	(221)	152	63

No. 89047.—Iris brown. Bill brownish black. Feet intense vermilion, without the slightest trace of orange; joints and naked part of tibia dark brown; nails black; under side of toes orange.

No. 92767.—Iris dark brown. Bill blackish olive-gray, a narrow space at base of lower mandible reddish flesh-color. Feet orange red, joints dusky.

The natives call the Turnstone "*Krasnonogoj Kulik,*" *i. e.*, red-legged Sand-snipe, and their Aleutian name of it is "*Kidmdlgikh.*" It makes its appearance early in May (in 1883 the first ones were observed on the 7th), and the beach, especially on the north shore of Bering Island, fairly swarms with them. In June they disappear, and only a few remain during the summer. These, I suppose, to breed, although I did not succeed in finding any of their nests. However, as early as the latter part of July, even larger flocks than those seen in spring, return from the north. From this time and until late in autumn enormous masses of them may be seen on the killing grounds, near the seal rookeries, where thousands of putrified carcasses of the slain fur-seals swarm with myriads of the white larvæ of the flesh-fly, upon which the pretty turn stones feed and grow exceedingly fat. At sunset they retire to the beach, where they pass the night, not, however, without having performed a soldier-like drill by flying up and down the endless tundra, now in full body, now again in detached divisions, and with admirable precision turning and maneuvering as if obeying the command of a leading officer.

34. Charadrius squatarola (LIN.).

1758.—*Tringa squatarola* LIN., Syst. Nat., 10 ed., I, p. 149.—*Charadrius sq.* MIDD., Sibir. Reise, II, 2 (p. 290) (1853).

1766.—*Tringa helvetica* LIN., Syst. Nat., 12 ed., I, p. 250.—*Squatarola h.* KITTL., Denkw., II, p. 401 (1858).—CASSIN, Pr. Ac. Phil., 1858, p. 195.—SCHRENCK, Reis. Amurl., I, p. 409 (1860).—SWINH., Ibis, 1860, p. 63.—*Id.*, *ibid.*, 1861, pp. 51, 342.—*Id.*, *ibid.*, 1863, p. 404.—*Id.*, *ibid.*, 1870, p. 360.—*Id.*, *ibid.*, 1875, p. 452.—*Id.*, P. Z. S. 1863, p. 309.—*Id.*, *ibid.*, 1871, p. 403.—RADDE, Reis. Süd. Ost-Sibir., II (p. 322) (1863).—DYB. & PARVEX, J. f. Orn. 1868, p. 337.—PRZEW., Putesch. Ussur. (p. 151) (1870).—TACZAN., J. f. Orn., 1873,

p. 101.—*Id.*, Bull. Soc. Zool. France, 1876, p. 249.—*Id.*, Orn. Faun. Vost, Sibir., p. 53 (1877).—BLAKIST. & PRYER, Ibis, 1878, p. 219.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 192.—*Iid.*, *ibid.*, X, 1882, p. 108.—BEAN, Pr. U. S. Nat. Mus. 1882, p. 163.—NELSON, Cruise Corwin, p. 84 (1883).—BLAKIST., Amend. List B. Jap., p. 11 (1884).

1826.—*Charadrius hypomelanus* PALL., Zoogr. Ross. As., II, p. 138.

1826.—*Charadrius pardela* PALL., Zoogr. Ross. As., II, p. 142.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*
92770	1638	Bering Island	Sept. 14, 1882	jun.	292	184	72
89069	1645	......do	Sept. 18, 1882	♀	296	195	72
92769	1654	......do	Sept. 21, 1882	♂	303	190	75
92771	2789	......do	Sept. —, 1883	....	......	197	81

No. 92770.—Iris blackish brown. Bill olive black. Feet dark gray.

The Gray Plover was only observed on Bering Island during the fall migration, at which time they seem to arrive regularly. Several flocks were met after the middle of September. I saw a single bird still on the 28th of October in a flock of *Charadrius fulvus*.

35. Charadrius dominicus fulvus (GM.).

1788.—*Charadrius fulvus* GM., Syst. Nat., I, ii, p. 687.—PRZEW., Putesch. Ussur. (p. 152) (1870).—SWINH., P. Z. S., 1871, p. 403.—*Id.*, Ibis, 1874, p. 162.—*Id.*, *ibid.*, 1875, p. 452.—TACZAN., J. f. Orn., 1873, p. 101.—*Id.*, *ibid.*, 1874, p. 336.—*Id.*, Bull. Soc. Zool. France, 1876, p. 246.—*Id.*, *ibid.*, 1883, p. 339.—*Id.*, Orn. Faun. Vost. Sibir., p. 51 (1877).—BLAKIST. & PRYER, Ibis, 1878, p. 218.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 191.—*Iid.*, *ibid.*, X, 1882, p. 107.—COUES, in Elliott's Aff. Alaska, p. 179 (1873).—ELLIOTT, Monog. Seal Isl., p. 129 (1882).—STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 71.—BLAKIST., Amend. List B. Jap., p. 10 (1884).

1822.—*Charadrius pluvialis* HORSF., Tr. Linn. Soc., XIII, p. 187 (*nec* LIN.).—PALL., Zoogr. Ross. As., II, p. 141 (*part*) (1826).—MIDDEND., Sibir. Reise, II, 2 (p. 210) (1853).—CASS. in Perry's Explor. Exped. Jap., II p. 247 (1857).—SCHRENCK, Reis. Amurl., I, p. 410 (1860).—COINDE, Rev. Mag. Zool., 1860, p. 40.—SWINH., Ibis, 1862, p. 307.—RADDE, Reis. Süd. Ost—Si.., II (p. 322) (1863).

1830.—*Charadrius virginianus* JARD. & SELB., Ill. Orn., II (pl. lxxxv).

1849.—*Charadrius auratus orientalis* TEMM. & SCHLEG., Faun. Jap. Aves (p. 104, pl. lxii).—*Ch. orientalis* WHITELY, Ibis, 1867, p. 204.

1849.—*Charadrius virginius* BLYTH, Cat. B. Mus. As. Soc. Beng. (p. 262) (*nec* BORKH.).—SWINH., Ibis, 1860, p. 358.—*Id.*, *ibid.*, pp. 51, 342.—*Id.*, *ibid.*, 1862, pp. 254, 307.—*Id.*, *ibid.*, 1875, p. 452.

1856.—*Pluvialis longipes* BP., Compt. Rend., 1856 (p. 417).—*Charadrius l.* SWINH., P. Z. S., 1862, p. 319.—*Id.*, *ibid.*, 1863, p. 309.—*Id.*, Ibis, 1863, p. 404.—*Id.*, *ibid.*, 1870, p. 360.

1862.—*Charadrius mongolicus* BLAKIST., Ibis, 1862, p. 330 (*nec* PALL.).

1880.—*Charadrius dominicus fulvus* Ridgw., Pr. U. S. Nat. Mus., 1880, p. 198.—Nelson, Cruise Corwin, p. 84 (1883).—Turner, Auk, 1885, p. 157.
?.—*Charadrius affinis* Boie, Oken's Isis (fide Giebel; cfr. Bp. & Gray; ubi?).

The present form is distinguished from its near American relative, *Ch. dominicus* Müll., which also has the axillaries smoky gray, by the greater brightness of the yellow color. The Asiatic Golden Plover is, however, the form which occurs most commonly in Alaska, occupying the whole shore line of Bering Sea, while the true *dominicus* only breeds in the interior and along the coast of the Arctic Ocean. The individuals of *fulvus* breeding in America migrate in winter along the Asiatic coasts, thus giving evidence of the way in which the species once immigrated into Alaska.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wings beyond tail.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*
92777	2077	Bering Island	May 15, 1883	(♂) ad.	(233)	......	149	02
92776	2117	......do	June 3 1883	♂ ad.	258	12	167	59
89070	1650	......do	Sept. 21, 1882	♂	237	....	156	58
92773	1674	......do	Oct. 8, 1882	♂	....	......	161	63
92775	1673	......do	Oct. 8, 1882	♂	....	......	160	61
92774	1675	......do	Oct. 8, 1882	♀	....	......	158	58
92772	2790	......do	Sept. —, 1883	....	....	......	160	59

No. 92776.—Iris dark hazel. Bill black. Legs dark olive gray; feet more blackish. Extremely fat. New feathers on the shoulders still in their sheaths. Claw of middle toe of backwards stretched legs reached 15 mm beyond the tips of closed wings.

No. 89070.—Iris dark brown. Bill black, olive at the angle of mouth. Feet dark bluish gray; toes more dusky.

The Asiatic Golden Plover visits Bering Island both on going northward in spring and southward again in autumn, but is not known to breed there, although suitable localities might easily be found; nor are they numerous during the migration either, but the small flocks remain in fall for a considerable time. They arrive about the middle of May, coming again after the 15th of September. In 1882 the last ones were observed on the 28th of October.

16. Ægialitis mongola (Pall.).

1776.—*Charadrius mongolus*[*] Pall., Reise Russ. Reichs, III (p. 700).—*Ægialites m.* Swinh., P. Z. S., 1870, p. 140.

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[*] *Mongolus, a, um* adj., pertaining or belonging to the Mongols (*Mongoli*, the inhabitants of *Mongolia*), formed in accordance with the classic *Hispanus, a, um*, from *Hispani*, the Spaniards, and *Hispania*, Spain.

1826.—*Charadrius mongolicus* PALL., Zoogr. Ross. Ass., II, p. 136.—MIDD., Sibir. Reise, II, 2 (p. 211, taf. xix, figs. 2, 3).—SCHRENCK, Reis. Amurl., p. 411 (1860).—RADDE, Reis. Süd. Ost-Sibir., II (p. 324) (1863).—PRZEW., Putesch. Ussur. (n. 153), (1870) —FINSCH, Verh. Zool. Bot. Ges. Wien, 1873, extr., p. 18.—*Ægialites m.* SWINH., P. Z. S., 1863, p. 310.—*Id.*, *ibid.*, 1870, p. 140.—*Id.*, *ibid.*, 1871, p. 404.—*Id.*, Ibis, 1870, p. 360.—HARTING, Ibis, 1870, p. 384.—*Id.*, P. Z. S., 1871, p. 110.—PELZ., Verh. Zool. Bot. Ver. Wien, 1873, extr., p. 6.—SEEB., Ibis, 1879, p. 25.—BLAKIST. & PRYER, Tr. As. Soc. Jap., VIII, 1880, p. 192.—*Id.*, *ibid.*, X, 1882, p. 108.—NELSON, Cruise Corwin, p. 85 (1883).—BLAKIST., Amend. List B. Jap., p. 10 (1884).—*Eudromias m.* TACZAN., Bull. Soc. Zool. France, 1876, p. 248.—*Id.*, *ibid.*, 1882, p. 397.—*Id.*, *ibid.*, 1882, p. 397.—*Id.*, Orn. Faun. Vost. Sibir., p. 52 (1877).—STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 71.—*Id.*, Naturen, 1884, p. 51.—BOGDAN., Consp. Av. Ross., I, p. 73 (1884).

1878.—*Ægialitis ruficapilla?* BLAKIST. & PRYER, Ibis, 1878, p. 219 (*nec* TEMM.).—SEEB., Ibis, 1879, p. 25.

DESCRIPTION.—♂ ad. *Breeding plumage* (U. S. N. M., No. 89051; L. Stejneger, No. 1041. Bering Island, May 11, 1882).

Forehead white, divided by a black line which, commencing from the culmen, borders the white frontlet above, then descends in front of the eye, uniting with the broad black loral stripe, which extends backwards under the eye, and occupies the ear-coverts; from the hind part of these a very narrow blackish line descends on the lower neck, uniting with the corresponding line from the other side, encircling the white chin and throat which, thus, on all sides are bordered with blackish; fore part of crown and a stripe over the eyes, behind communicating with the neck-ring, pale rufous; hind part of crown and nape brownish gray separated from the same color of the back by a rather narrow ring of a bright cinnamon rufous, which widens anteriorly so as to embrace the whole juglum and fore breast; shoulders and back brownish gray, with a just perceptible silky gloss of olive, fading into a lighter shade on the rump; wing-coverts and tertials of the same color; flanks brownish gray, with broad white edgings, remaining under plumage white, except tibiæ which are strongly tinged with rufous. Primaries blackish brown, fading into brownish gray on the inner ones, from the seventh with a mesial white spot in the outer web; shaft of the first primary white, those of the others only mesially so; large coverts, with white tips, forming a cross-bar. Tail-feathers dark brownish gray, this color fading gradually on the lateral ones; the outermost on each side white, with a wedge-shaped gray spot in the inner web near the tip; tips of all the rectrices, except the middle pair, edged with white.

For colors of naked parts and for dimensions, see "list of specimens collected."

A few of the white feathers of the forehead are slightly tipped with black. It seems as if the whole forehead had been black, the black edgings of the feathers having been worn away. This would account for the great variation of the extent of the white and black of the forehead in these birds, and such an assumption is supported by the fact that a specimen from Japan killed in April has almost the whole forehead black, while this color is still more reduced in specimens killed later than that described above. It is at least quite certain that the black forehead does not indicate the full summer plumage. The two other males of my collection differ from the above only in being a little less brightly colored, the eye-stripe decidedly paler, and the rufous breast-band narrower, showing, besides, only a faint trace of the black line separating the band from the white of the throat.

♀ ad. *Breeding plumage* (U. S. N. M., No. 89052; L. Stejneger, No. 1042. Bering Island, May 11, 1882).

Differs from the male in having the rufous parts much paler. The black markings on the forehead are almost absent, and under the eyes and on the ear-coverts replaced by blackish.

Other females of the collection show the markings on the head quite distinct, but of a dark brownish gray, and not black color. The collar is also much narrower.

The young bird in first plumage,

(No. 89050), resembles somewhat the adults. The brownish gray of the back is paler, and each feather narrowly edged with isabella color, with which also the lower parts are suffused; on the pectoral region a buffish tinge replaces the rufous collar, and the black markings are absent from the head, the cheeks and ear-coverts being slightly dusky; forehead between bill and eyes whitish, suffused with isabella color.

No. 92781 has only partly assumed the feathers. These are essentially as in the specimen just described, but the isabella-colored edgings are broad and the isabella suffusion stronger. Head and neck still downy, whitish, on forehead and cheeks suffused with isabella color; the latter parts with some blackish markings; crown of the head dark brownish gray, mottled finely with isabella color.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing beyond tail.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*
89051	1041	Bering Island	May 11, 1882	♂ ad.	190	......	130	53
89053	1052	do	May 15, 1882	♂ ad.	201	......	131	56
92778	2078	do	May 14, 1882	(♂) ad.	(187)	......	127	52
89052	1042	do	May 11, 1882	♀ ad.	190	......	132	53
89054	1053	do	May 15, 1882	♀ ad.	192	......	...	......
89055	1061	do	May 19, 1882	♀ ad.	206	......	133	57
89137	1214	Copper Island	June 19, 1882	♀ ad.	182	......	130	53
92780	2123	Bering Island	June 4, 1883	♀ ad.	201	5	128	50
92779	2218	Copper Island	July 2, 1883	♀ ad.	191	6	128	50
89050	1656	Bering Island	Sept. 22, 1882	♂ jun.	224	......	121	51
89049	1651	do	Sept. 22, 1882	♀ jun.	183	......	....	......
92781	2242	Copper Island	July 13, 1883	pull.	125	......	67	......

No. 89053.—Iris dark brown. Bill black. Feet somewhat bluish gray, toes darker.

No. 89054.—Feet faint yellowish gray, toes darker.

No. 89137.—Feet gray with a tinge of brownish, toes more blackish.

No. 92780.—Iris dark hazel. Bill black. Feet dark gray with an olive tinge; toes darker, blackish. Shot on the nest. Very fat. A large naked "blood-patch" on each side of the abdomen communicating behind.

No. 92779.—Feet gray, with a purplish-olive tinge; toes, especially the joints, darker, nearly blackish. Molting; new feathers protruding on crown and nape.

No. 89049.—Iris dark brown. Bill, angle of mouth, and ring round the eyes black. Legs clear gray; tarsus tinged with yellowish, toes with blackish, and soles with reddish.

No. 92781.—Iris dark hazel. Bill olive-black. Feet gray, with a tinge of yellowish olive; toes darker.

The Mongolian Plover is a very common summer resident on the Commander Islands, in fact, one of the most characteristic birds of their fauna.

It is one of the brightest and handsomest shore birds, and is always gladly welcomed when making its appearance during the first half of May. I used then to watch with delight these elegant runners, wondering at the almost incredible rapidity with which they move their legs when chasing each other over the pebbly beach, or trying to escape the approaching hunter. Very soon, however, the pairs retire to the place chosen for the summer home, and, as soon as the eggs are laid, the birds become more shy, and do not expose themselves as much as they did before. They do not fly directly from the nest either, but run away a distance from it before taking wing. It is therefore exceedingly difficult to find the nest, and I do not wonder that none of the Russian travelers have procured the nest and eggs. I myself only succeeded in finding a few nests with eggs, to be described further on. The eggs were found during the first days of June and young ones about the middle of July. About this time the families retire from the beach and are now met with in the interior, where they ascend the mountains in search of tender insects. I frequently met them at an altitude of 1,000 feet or more above sea level. About the middle of September the families return to the lowlands and to the beach, soon afterwards leaving the islands.

The call-note is a clear, penetrating "drrrriit!"

While at Glinka, on Copper Island, in July, 1883, a young bird of this species, not yet fully feathered (the same one described above), was brought to me alive. Allowed to run free on the floor it immediately commenced a very animated pursuit of the rather numerous flies, which were caught with remarkable precision and rapidity and devoured with an unsatiable appetite. The little fellow did not pay any attention to the presence of several persons in the small room, but when the dog rose from his nap in the corner, the swift-footed fly-killer suddenly dropped flat on the floor, with withdrawn neck, making himself as small and flat as possible, and remained thus perfectly immovable until the dog turned his head the other way, when he ran off to the darkest corner of the room, where he remained until the former laid down in his old place. Then he started the fly-hunting again; the dog rose once more, and the same performance was repeated. Within half an hour, however, he had learned that the dog did not take any notice of him whatever, and consequently he afterwards paid as little attention to the dog as to man.

The nest, spoken of above, was found on the islet Toporkof, on the 4th of June, 1883, and contained three eggs. They were lying, with their pointed end inwards and downwards, in a slight hollow in the ground between the stems of four *Angelica archangelica.* Dry particles of the leaves and stems of this plant, and numerous seeds of the same, formed the nest, being evidently brought together by the bird itself. The situation of the nest was about 40 feet from the line of high water, and about 14 feet above the level of the sea.

One of the eggs was quite clear; the second contained a small embryo in which only the large eyes were distinguishable; the third had a larger fœtus, with well-developed wings, legs, &c.

In general appearance the eggs recall those of *Ægialitis semipalmata,* being larger, however, and of a somewhat deeper ground color, in two eggs of set No. 21772 more olive, in the others more buff. The spots are, on the whole, smaller than, in average, specimens of the former, being in that respect more like *Æ. hiaticula.* They, consequently, are more unlike eggs of *Eudromias morinellus* than those of typical *Ægialites.*

Dimensions of the eggs.

U. S. Nat. Mus. No.	L. Stejneger No.	Locality.	Date.	Diameters.
				Millimeters.
21771	1377	Severnoje, Bering Island	July —, 1882	36.5 by 27
21770	1156	Village, Bering Island	June 4, 1882	36 by 20.5
				37 by 27
				36 by 27.25
21772	2124	Toporkoff, Bering Island	June 4, 1883	37.25 by 27
				36 by 27
				37 by 27

Family SCOLOPACIDÆ.

37. **Gallinago gallinago** (Lin.).

1758.—*Scolopax gallinago* Lin., Syst. Nat., 10 ed., I, p. 147.—Pall., Zoogr. Ross. As., II, p. 174 (1826).—Temm. & Schleg., Faun. Jap. Aves (p. 112) (1849).—Middend., Sibir., Reise, II, 2 (p. 224) (1853).—Schrenck, Reis. Amurl., I, p. 426 (1860).—Radde, Reis. Süd. Ost-Sibir., II, (p. 337) (1863).—Dybow. & Parvex, J. f. Orn., 1868, p. 338.—Przew., Putesch., Ussur. (n. 174) (1870).—*Gallinago g.* Licht., Nomencl. Mus. Ber., p. 93 (1854).

1801.—*Scolopax coelestis* Frenzel, Beschr. Vög. Wittenb. (p. 58).

1816.—*Gallinago media* Leach, Syst. Cat. M. B. Br., Mus. p. 31 (*nec* Bock, 1779).—Swinh., Ibis, 1866, p. 294.—Whitely, Ibis, 1867, p. 206.

1837.—*Gallinago uniclavus* Hogs., J. As. Soc. Beng., VI (p. 492).—Swinh., Ibis, 1860, p. 65.—*Id.*, *ibid.*, 1861, pp. 56, 343.—*Id.*, *ibid.*, 1862, p. 259.—Taczan., J. f. Orn., 1874, p. 325.—*Id.*, *ibid.*, 1875, p. 255.—*Id.*, Bull. Soc. Zool. France, 1876, p. 257.—*Id.*, *ibid.*, 1883, p. 340.—*Id.*, Orn., Faun. Vost. Sibir., p. 59 (1877).

1838.—*Gallinago scolopacinus* Bonap., Comp. List., p. 52.—Swinh., Ibis, 1863, p. 415.—*Id.*, *ibid.*, 1865, p. 347.—*Id.*, *ibid.*, 1867, p. 234.—*Id.*, *ibid.*, 1870, p. 362.—*Id.*, *ibid.*, 1874, p. 163.—*Id.*, P. Z. S., 1863, p. 314.—Finsch, Verh. Zool. Botan. Ver. Wien, 1872, p. 266.—Taczan., J. f. Orn., 1873, p. 106.—*Id.*, *ibid.*, 1874, p. 336.—*Id.*, Bull. Soc. Zool. France, 1876, p. 257.—*Id.*, Orn. Fauna East. Sibir., p. 59 (1877).—Blakist. & Pryer, Ibis, 1878, p. 222.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 197.—*Iid.*, *ibid.*, X, 1882, p. 114.—Seeb., Ibis, 1879, p. 27.—Blakist., Amend. List B. Jap., p. 12 (1884.)

1856.—*Gallinago japonica* Bonap., Compt. Rend., XLIII (p. 579).

1856.—*Gallinago burka* Bonap., Compt. Rend., XLIII (p. 579).—Swinh., P. Z. S., 1863, p. 314.—*Id.*, Ibis, 1865, p. 231.

? 1857.—*Gallinago stenura* Cassin in Perry's Exped. Jap. II, p. 227 (*nec* Temm.).

1883.—*Gallinago grallinaria?* Stejneger, Pr. U. S. Nat. Mus., 1883, p. 69.

The specimens collected by me have been carefully compared with a good series of typical *G. gallinago* from Europe, several skins from Japan and India, and a large series of *G. wilsonii* from North America, including Alaskan specimens. The result has been that the Bering Island birds, as also the Japanese, most decidedly belong to the European species, both in regard to number of tail-feathers, white lining of the wing, less heavy black cross-bars on the axillaries, less pronounced cross-bars on the outermost tail-feathers, and the greater breadth of the latter. In the birds from the Old World the outermost rectrices are almost twice as broad as those of *G. wilsonii*, a character which seems to me to be the most reliable one for distinguishing the two forms. The average length of the bill is greater in *gallinago*, but I have before me specimens of *G. wilsonii* in which the bill is considerably longer than in some from the Old World. Nevertheless the two forms are entitled to full specific rank.

List of specimens collected.

U. S. Nat Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Exposed culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92782	2153	Bering Island.......	June 9, 1883	♂ ad.	269	12	124	58	67	33	35
89072	1467	....do	Aug. 15, 1882	♂ ad.	270	......	130	57	70	32	36
89073	1522	....do	Sept. 6, 1882	♂ jun.	268	......	127	58	63	32	35
89071	1407	... do	Aug. 6, 1882	♀ ad.	255	......	123	57	66	30	35
89074	1631	....do	Sept. 10, 1882	♀	268	......	122	56	64	31	34
89075	1653	....do	Sept. 21, 1882	♀ jun.	264	......	121	50	65	33	36

No. 92782.—Bill brownish gray, blackish at tip. Feet gray, strongly tinged with yellowish olive. Not fat.

No. 89072.—Iris dark brown. Bill blackish brown at tip, olive gray at base, lower mandible more yellowish. Feet light olive gray, more bluish on the joints, more yellowish in front of tarsus and toes.

No. 89071.—In the crop remains of a *Lumbricus*, and in the stomach stones and remains of a *Helix* shell.

The common Snipe is tolerably common on Bering Island, and breeds in all suitable places, low swampy tundras, both on the extensive northern low lands and in the broader valleys of the southern part. In 1883 they were not observed before the 10th of May, but were at that time exceptionally numerous, being evidently migrating and prevented from landing in Kamtschatka on account of the enormous amount of snow covering the whole country down to the water's edge at that time.

The "bleating" sound of the Bering Island Snipe is identical with that of the European bird, being surprisingly like the bleating of a goat. On clear sunny days, between 10 and 12 o'clock in the forenoon, in the early part of the summer, this bleating could be heard almost anywhere in the swamps surrounding the village, so I had splendid opportunities for observing the birds during their singular performances. Very often the Snipe would rise so high in the air as to become almost invisible to the unaided eye, but still the strange sound rang vigorously down to the observer. Not only this power of the sound, but even more so the nature of the tune itself convinced me that it originates from the throat and not in any way either from the tail or the wing-feathers, as suggested by many European writers. It is true that the wings are in a state of very rapid vibration during the oblique descent when the note is uttered, but this circumstance does not testify only in favor of the theory of the sound being produced by the wing, as the vibration most conclusively accounts for the quivering throat-sound. Anybody stretching his arms out as if flying, and moving them rapidly up and down and simultaneously uttering any sound is bound to "bleat." Having heard, however, from my early days, of the wing or tail theories as the only orthodox ones, I did not feel convinced of the correctness of my own opinion until one evening I heard another bird of the same family produce a very similar note *while sitting on the ground*. Referring to the observation recorded under *Arquatella couesi*, I here only remark that the sound was so similar as to leave no doubt whatever in my mind that it had a similar origin in both cases.* It may be that a Snipe has never been observed bleating on the ground, but the fact that a so nearly allied bird is capable of producing essentially the same sound while in that position is an argument in favor of the more natural explanation of the sound originating from the organ which in almost all other instances is adapted to that purpose.

38. Arquatella couesi RIDGW.

1826.—*Trynqa arquatella* var. PALL., Zoogr. Ross. As., II, p. 190.

1869.—*Tringa maritima* DALL & BANN., Tr. Chic. Acad., I, 1869 (p. 291) (*nec* BRÜNN).—BAIRD, *ibid.* (p. 717).—HARTING, P. Z. S., 1871, p. 116.—FINSCH, Abh. Brem. Ver., III, p. 65 (1872).—DALL, Avif. Aleut. Isl. Unal. eastw., p. 4 (1873).—*Id.*, Avif. Aleut. Isl. west Unal., p. 6 (1874).—PALMÉN, Swed. Cat. Lond. Fish. Exh., p. 203 (1883).

1880.—*Arquatella couesi* RIDGW., Bull. Nutt. Orn. Cl., 1880, p. 160.—BEAN, Pr. U. S. Nat. Mus., 1882, p. 164.—NELSON, Cruise Corwin, p. 85, cfr. p. 56 e (1883).

1883.—*Arquatella* sp. STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 69.

1884.—*Tringa crassirostris* BOGDAN., Consp. Av. Ross., I, p. 88 (*nec* TEMM. & SCHLEG.)

The Aleutian Sandpiper is a perfectly good and distinct species, readily distinguished in all plumages from *Arquatella maritima*, with which it until a late date usually has been confounded. Having nothing to add to the excellent exposition given by Robert Ridgway in the Nuttall Bulletin for 1880 (p. 160), of the characters of this and allied species I only refer to that very important paper. It may, however, be well to emphasize that this species takes the place of *Arquatella maritima* BRÜNN. in the Pacific, and that *A. maritima* is not found on this side at all. All earlier references to that species as occurring in Bering Sea or adjacent waters properly belong either to *couesi* or *ptilocnemis*.

Arquatella ptilocnemis COUES, from the Prybilof Islands, does not winter on the Commander Islands, as conjectured by Mr. W. H. Elliott (Monogr. Seal Islands, p. 129), nor does it visit them during the migration. Dr. G. Hartlaub, in a very important contribution to the Alaskan Avifauna (Beitrag zur Ornithologie von Alaska, Journ. f. Ornith., 1883, p. 279), shows that *A. ptilocnemis* winters along the northwestern coast of North America. He reports one specimen having been procured by Messrs. Krause at Portage Bay on the 27th of December, and two females on January 27. The travelers remark that the species was not seen in large flocks before the end of April, and that it was absent during the summer.

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* I would not be surprised if the "drumming" sound of *Bonasa umbellus* is capable of a similar explanation, but having had no opportunities of observing the bird myself I offer this remark only as a hint for ornithologists with better facilities.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Expos. culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89033	1031	Bering Island	May 10, 1882	♂ ad.	198	......	......	......	......	......	......
89035	1039	......do..............	May 11, 1882	♂ ad.	196	......	118	57	27	24	27
92703	1085	......do..............	May 24, 1882	♂ ad.	......	......	......	......	......	......	......
89181	1107	.... do	May 29, 1882	♂ ad.	191	.....	117	57	26	23	26
89043	1468	..... do..............	Aug. 15, 1882	♂ ad.	215	......	120	58	29	25	28
89044	1657	......do..............	Sept. 22, 1882	♂ ad.	204	......	......	......	......	......	......
89045	1658	......do..............	Sept. 22, 1882	♂ ad.	208	......	121	58	26	24	28
92785	1695	......do..............	Oct. 24, 1882	♂ ad.	204	......	118	58	25	23	27
92787	2001	......do..............	Apr. 4, 1883	♂ ad.	203	......	118	56	25	23	27
92786	2004	......do..............	Apr. 28, 1883	♂ ad.	209	9	123	57	26	23	26
89038	1048	..... do..............	May 14, 1882	♀ ad.	212	......	121	58	29	23	27
89182	1108	......do..............	May 29, 1882	♀ ad.	207	......	123	58	30	24	27
89034	1137	......do..............	May 29, 1882	♀ ad.	211	......	123	58	28	24	28
89037	1345	......do...	Aug. 1, 1882	♀ ad.	209	......	118	55	27	25	28
92788	1655	......do..............	Sept. 22, 1882	♀ ad.	214	......	123	59	29	23	29
92784	1694	......do..............	Oct. 24, 1882	♀	218	....	......	......	......	......	......
89036	1044	......do..............	May. 13, 1882	♀ ad.	206	......	118	57	29	23	28
89042	1410	......do..............	Aug. 6, 1882	....	205	......	121	60	27	25	28
89039	1263	......do..............	July 17, 1882	jun.	.....	......	110	44	24	24	28
89040	1344	......do..............	Aug. 1, 1882	pull.	117	......	......	.....	15	22	25
92790	2178	......do..............	June 17, 1882	pull.	97	......	......	......	11	21	26
92789	2241	Copper Island.......	July 13, 1883	pull.	132	......	62	....	17	23	26

No. 89035.—Bill blackish gray with an olive tinge, yellowish olive gray towards the base. Feet, yellowish olive gray; toes darker.

No. 89181.—Iris dark brown.

No. 92785.—Bill olive blackish towards tip, yellowish towards base. Feet olive yellow, joints darker olive.

No. 92786.—Bill olive blackish at tip, yellowish at base. Feet dull olive yellow, joints darker olive gray. Tip of tail reached middle of basal phalange of middle toe, legs being stretched backwards, while tip of wings reached the tarsal joint. New feathers protruding all over the body. Testes large, swollen. Very fat. In the stomach, remains of a *Lumbricus* and a larva of a beetle.

No. 89037 is the mother of the chick No. 89040.

No. 89040.—Iris dark brown. Bill olive gray, blackish at tip. Feet brownish gray.

No. 92790.—Bill olive black. Feet violet gray.

No. 92789.—Bill blackish brown, lighter and more olive at the base. Feet, gray with a light olive tinge.

The "Lajdinij Kulik," or Beach-Snipe, as it is called by the natives, is one of the few residents of the Commander Islands, which is found there during both summer and winter, and is the only member of the order *Grallæ* wintering on the rough shores of these storm beaten regions. During the whole winter small flocks, consisting of ten to thirty individuals, are to be seen at low water eagerly picking up Gammarids among the stones close to the breakers. In March their ranks are re-enforced by new comers which have wintered on more hospitable shores, and in the latter part of the month enormous flocks of five hundred or more swarm along the beach, especially on the north shore. About one month later the great flocks dissolve into small companies, which, following the water courses, disperse over the whole island, settling in pairs on suitable places at the beaches, on the tundras, or on the mountain plateaus, this bird being in fact one of the most numerous and the most equally distributed species of land birds on the islands. About this time, that is to say, about the middle of April, the brightly-colored summer plumage is assumed, and now commences that poetic time which makes even the dull shore bird sing as spiritedly as any of the true singing birds, *Oscines*, and sweeter than many of them. It was in the late afternoon of the 28th of April, 1883, that I first witnessed this singing performance of the Sandpiper. The bird rose from the *Rhododendron* tundra on the northern slope of Kamennij Valley, and while flying about on quivering wings, sometimes remaining quite still in the air, it uttered a loud, agreeable, and melodious twitter, which really must be called a "song," whereupon, with outstretched wings, it descended obliquely, seating itself upon the top of a tussock. Sitting there, with puffed plumage and pendant wings, it produced a loud "bleating," so much like that of *Gallinago gallinago* as to completely convince me that the analogous note of the latter is produced by the throat in exactly the same manner. During the "bleating" the whole bird was quivering with a tremulous motion as if in a high state of excitement. The voice was slightly more melodious than that of the snipe, but I was not fully convinced of the identity of the bird until it was lying bleeding among the Rhododendrons before me. It was a male, No. 2004 of my collection.

The first eggs are laid about the middle of May. On the 17th of June I got a newly-hatched chick. Like so many other members of the same order, the mother shows great love for her offspring, trying all sorts of devices to divert the attention of the approaching hunter from the young ones to herself, risking her own life in order to save theirs. Once

I caught one of the downy chicks alive. Holding it in my hand I watched the behavior of the distressed mother. At first she feigned lameness, crying piteously, running about with hanging wings, stumbling and rolling over at every second step. As I did not follow her she came nearer and nearer, at last so close that a stroke of a stick saved me a discharge of the gun.

39. **Actodromas acuminatus** (HORSF.).

1821.—*Totanus acuminatus* HORSFIELD, Tr. Linn. Soc., XIII (p. 192).—*Tringa a.* SWINH., P. Z. S., 1863, p. 316.—*Id.*, *ibid.*, 1871, p. 409.—*Id.*, Ibis, 1863, p. 412.—*Id.*, *ibid*, 1875, p. 455.—TACZAN., J. f. Orn., 1874, pp. 332, 336.—*Id.*, *ibid.*, 1876, p. 201.—*Id.*, Bull. Soc. Zool. France, 1876, p. 252.—*Id.*, *ibid.*, 1882, p. 397.—*Id.*, Orn. Faun. Vost. Sibir., p. 55 (1877).—BLAKIST. & PRYER, Ibis, 1878, p. 221.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 195.—*Iid.*, *ibid.*, X, 1882, p. 112.—BLAKIST., Amend. List B. Jap., p. 3 (1884).—BOGDAN., Consp. Av. Ross., I, p. 91 (1884).—*Actodromas a.* RIDGW., Pr. U. S. Nat. Mus., 1880, p. 222.—*Id.*, Nomencl. N. A. B., p. 68 (1881).—BEAN, Pr. U. S. Nat. Mus., 1882, p. 164.—NELSON, Cruise Corwin, p. 86 (1884).
1839.—*Tringa australis* JARD. & SELBY, Illustr. Orn., II (pl. 91)
1853.—*Tringa rufescens* MIDDEND., Sibir. Reise, II, 2 (p. 221) (*nec* VIEILL.).
1863.—*Tringa pectoralis* SWINH., Ibis, 1863, p. 97 (*nec* SAY).
1873.—*Tringa crassirostris* TACZAN., J. f. Orn., 1873, p. 103 (*nec* T. & S.).

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Expos. culmen.	Middle toe with claw.	Tarsus.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89029	1646	Bering Island....	Sept. 19, 1882	♀ jun.	211	......	127	59	24	26	28
89031	1652	......do	Sept. 21, 1882	♀ jun.	201	......	127	54	24	28	30
89032	1659	......do	Sept. 23, 1882	♀ jun.	200	......	123	55	23	27	28
92794	1676	......do	Oct. 7, 1882	♀ jun.	....	......	135	59	25	29	31
89028	1637	......do	Sept. 13, 1882	jun.	226	......	136	59	25	30	32
89030	1641	......do	Sept. 15, 1882	jun.	210	0	126	56	22	28	30

No. 89029.—Iris dark brown. Bill blackish brown, more brownish, or rather dark reddish gray, at the mouth angle, and somewhat lighter gray at base of lower mandible. Feet ocher-yellow, tinged with olive, and with darker joints.

No. 89028.—Bill blackish brown, lighter towards base, which, especially on the lower mandible, is olive gray. Feet gray, strongly tinged with yellowish olive; joints purer and darker gray. Stomach contained *Gammaridæ*.

No. 89030.—Outstretched legs, with the tip of toes, reached 30mm beyond the tip of tail.

Of this species I only obtained young specimens on Bering Island during the autumnal migration of 1882. From the middle of September and during the following three weeks they were observed both on the tundra near the great lake and on the rocky beach of the ocean searching for Gammarids. They were very shy and mostly single or in small families. Larger flocks were never seen.

40. Actodromas damacensis (Horsf.).

1821.—*Totanus damacensis* Horsf., Tr Linn. Soc., XIII (p. 192), (*nec* Taczanowski)—*Tringa d.* Swinh., P. Z. S., 1863, p. 316.—*Id.*, *ibid.*, 1871, p. 409.—*Id.*, Ibis, 1863, p. 413.—*Id.*, *ibid.*, 1875, p. 455.—Blakist. & Pryer, Ibis, 1878, p. 221.

1853.—*Tringa subminuta* Middend., Sibir-Reise, II (p. 222, tab. xix, fig. 6).—Schrenck, Reis. Amurl., I, p. 424, (1860).—Swinh., Ibis, 1862, p. 255.—*Id.*, *ibid.*, 1863, p. 97.—Radde, Reis. Süd. Ost-Sib., II (p. 333), (1863).—Dybow. & Parvex, J. f. Orn., 1868, p. 337.—Taczan., J. f. Orn., 1873, p 103.—*Id.*, Bull. Soc. Zool. France, 1876, p. 253.—*Id.*, *ibid.*, 1883, p. 330.—*Id.*, Orn. Fauna Vost. Sibir., p. 56 (1877).—Blakist. & Pryer, Tr. As. Soc. Jap., X, 1882, p. 112.—Blakist., Amend. List B. Jap., p. 37 (1884).—Seeb., Ibis, 1884, p. 34.—Bogdan., Consp. Av. Ross., I, p. 92 (1884).—*Actodromas s.* Stejneger, Pr. U. S. Nat. Mus., 1883, p. 71.

1871.—*Tringa salina* Dresser, B. of Eur., pt. vii, T. min., p. 4 (*nec* Pall.).

1879.—*Tringa ruficollis* Seebohm, Ibis, 1879, p. 26 (*nec* Pall.).—Blakist. & Pr., Tr. As. Soc. Jap., VIII, 1880, p. 195.

Having heard of no doubt concerning the identification of Horsefield's *damacensis* with Middendorff's *subminuta*, I adopt it without further comment.

Dresser is certainly wrong when, in his admirable "History of the Birds of Europe," he identifies Pallas's *salina* with the present species. Not only does the description of the color, "collum a gula ad pectus totum ferrugineum," prohibit such an identification, but also the measurements, as the middle toe is only given as 9⅛‴, that is 0.76 inch. In Dresser's *salina* the middle toe is 0.9 inch.

It is difficult to say what Taczanowski's *damacensis* is (Bull. Soc. Zool. France, 1876, p. 253). So much is certain, that it is not the same as Horsefield's bird, provided the latter be identical with *subminuta* Midd. He gives four distinct species from Eastern Asia, viz, *Tringa subminuta*, *salina*, *temminckii*, and *damacensis*. Having had specimens of all four, the latter is not likely to be a synonym of any of the foregoing, the more so as it seems that he has had all of them both in spring and autumnal plumage (cfr. J. f. Orn., 1873, p. 103). The probability is, therefore, that his *damacensis* rests upon a specimen of the true western *minuta*, which also seems to occur in the interior of Asia, without reaching the borders of the Pacific Ocean, however.* The only difficulty arises from his identification of Pallas's *T. cinclus* with *damacensis* Taczan. He says: "Il n'y a aucun doute que la description de Pallas s'applique à cette éspèce," while, in my opinion, there cannot be the slightest doubt that Pallas's *cinclus* belongs to *A. temminckii*. Pallas describes it as having the wings blackish, "remige *prima rachi alba*," and the tail elongated, "*rectricibus lateralibus albis*." These are the

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*Cfr. Swinhoe's statement (P. Z. S., 1871, p. 409), under the head of *salina*, "I have seen the true *T. minuta* in summer plumage, from Lake Baikal." Cfr. also the list of specimens of *minuta* in Saunders's collection, among which one from Baical by Dr. Dybowski (Dresser *l. c.*).

essential character of *temminckii*, and if Taczanowski's bird agrees with Pallas's description in these points, then certainly it belongs to *temminckii*, and neither to *minuta* nor any of the other three species.

A glance at the dimensions given in the "list of specimens collected" shows at once that the birds from Bering Island are correctly identified as the Long-toed Stint.

Much confusion concerning these small waders has arisen from the fact that most writers have ignored the structural differences by which they are easily and surely kept apart, while they have relied more upon characters of the plumage, so variable in these birds, and so extremely difficult to describe with the necessary precision. A synoptical table of the species occurring on the Asiatic shores of the Pacific Ocean may not be out of place, the more as all belong to the fauna of the Commander Islands.

a^1. Middle toe with claw longer than exposed culmen; tip of outstretched toes reaching far beyond the tip of tail.

- **b^1.** Tail reaching to the end of folded wings, simply graduated; middle toe with claw shorter than tarsus; shafts of all primaries white medially. *A. acuminatus.*
- **b^2.** Tail reaching beyond the tips of folded wings, the four outer pairs of tail-feathers being equal in length, or the outermost even longer than the next ones; middle toe with claw longer than tarsus; shaft of first primary only, white. *A. damacensis.*

a^2. Middle toe with claw equal to exposed culmen; tip of outstretched toes reaches the tip of tail.

- **b^1.** Tail doubly emarginated, the outermost feathers being longer than the next ones; shafts of all primaries white; outer tail-feathers light brownish gray; legs blackish .... *A. ruficollis.*
- **b^2.** Tail simply graduated, or the outermost tail-feathers at least not longer than the next ones; shaft of first primary only, white; two or three outer tail-feathers on each side white; legs yellowish gray .... *A. temminckii.*

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Expos. culmen.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92797	2102	Bering Island	May 23, 1883	(♂) ad.	(153)	......	85	39	17	23
92798	2104	......do	May 23, 1883	(♂) ad.	(143)	......	85	39	17	25
89021	1103	......do	May 29, 1882	♀ ad.	153	......	92	40	18	25
89022	1104	......do	May 29, 1882	ad.	152	......	87	39	18	25
89024	1415	......do	Aug. 7, 1882	ad.	158	11	88	40	19	24

No. 89021.—Iris dark brown. Bill blackish; olive-brown at base of lower jaw. Feet grayish yellow with joints darker olive.

No. 89024.—Colors as in foregoing specimen. Tip of tail reaches scarcely beyond the tarsal joint of the outstretched legs.

The Long-toed Stint arrives at Bering Island in large flocks during the latter part of May, and are then met with on sandy beaches, where the surf has thrown up large masses of sea-weed, busily engaged in picking up the numerous small crustaceans, &c., with which the weeds abound. Most of the birds stay only a few days, going further north, while a small number remain over summer, breeding sparingly on the large swamp behind the village. My efforts to find the nests were unsuccessful, but I shot birds near Zapornaja Reschka on the 17th and 22d of June, and on the 7th of August.

41. Actodromas ruficollis (PALL.).

1776.—*Tringa ruficollis* PALL., Reis. Russ. Reichs, III (p. 700).—BLAKIST. & PRYER, Tr. As. Soc. Jap., X, 1882, p. 112.—BLAKIST., Amend. List B. Jap., p. 37 (1884).—SEEB., Ibis, 1884, p. 34 (*nec* 1879, *quæ damacensis*).—BOGDAN., Consp. Av. Ross., I, p. 93 (1884).

1823.—*Tringa albescens* TEMM., Pl. Color., V, livr. vii, pl. 41, fig. 2.—SWINH., P. Z. S., 1863, p. 316.—*Id.*, Ibis, 1863, p. 413.—*Id.*, *ibid.*, 1870, p. 363.—*Id.*, *ibid.*, 1875, p. 455.—BLAKIST. & PRYER, Ibis, 1878, p. 221.—*Ibid.*, Tr. As. Soc. Jap., VIII, 1880, p. 195.

1826.—*Trynga salina* PALL., Zoogr. Ross. As., II, p. 199 (*nec* DRESSER, 1871, *quæ damacensis*).—DYBOW. & PARVEX, J. f. Orn., 1868, p. 337.—TACZAN., J. f. Orn., 1873, p. 103.—*Id.*, Bull. Soc. Zool. France, 1876, p. 253.—*Id.*, *ibid.*, 1883, p. 340.—*Id.*, Orn. Faun. Vost. Sibir., p. 56 (1877).

1853.—*Tringa minuta* MIDD., Sibir. Reise, II, 2 (p. 221, *part*).—SCHRENCK, Reise Amurl., I, p. 423 (1860).—SWINH., Ibis, 1860, pp. 342, 358 (*nec* LEISL.).—*Id.*, *ibid.*, 1862, p. 255.—WHITELY, Ibis, 1867, p. 206.

1862.—*Tringa temminckii* BLAKIST., Ibis, 1862, p. 330 (*nec* LEISL.).

1883.—*Actodromas damacensis* STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 71 (*nec* HORSF.).

Specimens from Japan, China, and Senjavin Straits have been at hand for comparison.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Middle toe with claw.	Expos. culmen.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92795	2115	Bering Island	June 3, 1883	♂ ad.	158	0	97	44	18	18
89025	1099	......do	May 29, 1882	♀ ad.	151	......	99	45	19	19
89170	1100	......do	May 29, 1882	♀ ad.	151	......	100	45	19	19
89171	1101	......do	May 29, 1882	♀ ad.	152	......	102	45	19	18
89172	1102	......do	May 29, 1882	♀ ad.	165	......	105	47	18.5	18
92796	2569	......do	Sept. 9, 1883	juv.	......	......	96	43	18	18

No. 92795.—Iris dark brown. Bill olive-black, as are also the feet. Very fat. Testes large, swollen.
No. 89025.—Bill black. Legs grayish black.
No. 92796.—Iris dark brown. Feet blackish gray.

This species arrives at Bering Island late in May in rather large flocks, but does not stay long. None were met with during the whole summer, until, in the first half of September, they took a short rest on the shores of our island before continuing their long travel to the southward.

42. Actodromas temminckii (Leisl.).

1787.—*Tringa pusilla* Latham, Suppl. Syn. B., I, p. 292 (*nec* Lin.).

1812.—*Tringa temminckii* Leisler, Nachtr. Bechst. Naturg. Deutschl., II (p. 63).—Middend., Sibir. Reise, II, 2 (p. 221).—(*T. temmingii*) Kittl., Denkw., II, p. 196? (1858).—Schrenck, Reis. Amurl., I, p. 442 (1860).—Radde, Reis. Süd. Ost-Sibir., II (p. 332) (1863).—Swinh., P. Z. S., 1863, p. 317.—*Id.*, *ibid.*, 1871, p. 409.—*Id.*, Ibis, 1860, p. 66.—*Id.*, *ibid.*, 1861, p. 342.—*Id.*, *ibid.*, 1862, p. 255.—*Id.*, *ibid.*, 1863, p. 412.—Dybow. & Parvex, J. f. Orn., 1868, p. 337.—Taczan., J. f. Orn., 1873, p. 103 —*Id.*, *ibid.*, 1874, p. 336.—*Id.*, Bull. Soc. Zool. France, 1876, p. 254.—*Id.*, Orn. Fauna Vost. Sibir., p. 57 (1877).—*Actodromus t.* Bonap., Cat. Parzud., p. 15 (1856).—*Actodromas t.* Stejneger, Proc. U. S. Nat. Mus., 1883, p. 71.

1826.—*Tringa cinclus* Pall., Zoogr. Ross. As., II, p. 201 (*nec* Lin.).

1882.—? *Tringa damacensis* Taczan, Bull. Soc. Zool. France, 1882, p. 396 (*nec* Horsf.).

My specimens agree perfectly with examples from Scandinavia and India.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Middle toe with claw.	Expos. culmen.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92798	2094	Bering Island...............	May 28, 1883	(♂) ad.	(142)	......	91	46	18	18
92800	2116	......do......................	June 3, 1883	♂ ad.	155	5	93	47	17	17
92801	1686	......do......................	Oct. 15, 1882	♂ ad.	152	......	93	46	17	18
89023	1414	......do......................	Aug. 9, 1882	jun.	144	......	94	43	18	17.5

No. 92800.—Iris dark brown. Bill olive black, lighter olive brownish at base, especially on lower mandible. Feet olive yellow, joints more dusky. Fat. Testes very large, 10^{mm} long; swollen.

No. 92801.—Iris dark brown. Bill olive black, lighter below at base. Feet yellowish gray. Tip of outstretched toes reaching the end of the tail; tips of closed wings only the end of the under tail-coverts.

No. 89023.—Iris blackish brown. Bill olive gray at base, blackish at tip. Feet light gray, with a faint tinge of yellow; joints darker gray; nails black. Tip of outstretched toes scarcely reaching the end of tail; tips of closed wings reach the end of tail.

Like the foregoing species, only met with on Bering Isand during the migration seasons; mostly only single individuals either alone or among the flocks of the foregoing two species. A young bird was shot on the tundra August 9, 1882, and it may possibly have been hatched on the island. At all events, Temminck's Stint is a rare bird compared with the two others.

43. Pelidna alpina pacifica (Coues).

1813.—*Tringa alpina* Wilson, Am. Orn., VII (p. 25, pl. 56, f. 2).—Blakist., Ibis, 1862, p. 330.—Swinh., Ibis, 1866, p. 136, *Id.*, *ibid.*, 1870, p. 363.—Whitely, Ibis, 1867, p. 205.—Harting., P. Z. S., 1871, p. 115.—*Scolopax a.* Pallas, Zoogr. Ross. As., II, p. 176, (*part*).—*Pelidna a.* Stejneger, Pr. U. S. Nat. Mus., 1883, p. 69.

1849.—*Tringa variabilis* Temm. & Schleg., Faun. Jap. Aves (p. 108).

1858.—*Tringa alpina* var. *americana* Cassin, Baird's B. N. Amer., p. 719.—*Pelidna a. a.* Dall & Bannist., Tr. Chicago Ac., I, 1869, p. 291.—Bean. Pr. U. S. Nat. Mus., 1882, p. 165.—Nelson, Cruise Corwin, p. 88 (1883).—Hartlaub, J. f. Orn., 1883, p. 280.

1860.—*Tringa cinclus* Schrenck, Reis. Amurl., I, p. 121.—Swinh., Ibis, 1860, p. 66.—*Id*,, *ibid.*, 1861, p. 412.—*Id.*, *ibid.*, 1863, pp. 97, 411.—*Id.*, *ibid.*, 1875, p. 455.—*Id.*, P. Z. S., 1863, p. 316.—Taczan., Bull. Soc. Zool. France, 1876, p. 253.—Blakist. & Pryer, Ibis, 1878, p. 221.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 195.—*Iid.*, *ibid.*, X, 1882, p. 111.—Blakist., Amend. List B. Jap., p. 37 (1884).

1861.—*Tringa subarquata* Swinh., Ibis, 1861, p. 342, (*nec* Güld.).

1861.—*Pelidna pacifica* Coues, Pr. Acad. Philada., 1861 (p. 189).

1862.—*Tringa chinensis* Swinh., Ibis, 1862, p. 255 (*nec* Gray?).

1871.—*Tringa cinclus* var. *chinensis* Swinh , P. Z. S., 1871, p. 408 (*nec* Taczan. 1873).

1876.—*Tringa damacensis* Blakist., Ibis, 1876, p. 334 (*nec* Horsf.).

As I have already remarked in my "Contributions, &c., No. 1" (Pr. U. S. Nat. Mus., 1883, p. 69), the specimens of the Dunlin collected by me on Bering Island are distinguishable from the typical *Pelidna alpina* by its purer colors. Upon a close examination I now find that my birds agree in every particular with the American form, not only in size, but also in coloration, the bright rusty of the upper parts predominating more and the black of the lower parts being more restricted and of a deeper shade. From all data accessible to me I regard it as certain that all references to a larger form of *Pelidna alpina* or *cinclus* as occurring in the coast regions of Eastern and Northeastern Asia* belong to this form, also including Swinhoe's *chinensis*, with which Taczanowski's variety of the same name is not identical, being referable to a smaller race, afterwards by him given as *Tringa schinzii*. I have been able to compare large series, and am inclined to think that *Pelidna pacifica* is entitled to full specific rank.

In explanation of the change of name in this form a few remarks may not be out of place:

In 1822 C. L. Brehm described as *Tringa schinzii* a small race of *Pelidna alpina* L., from Central Europe. Bonaparte, on the other hand, in 1826, in his "Observations on the Nomenclature of Wilson's

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* Birds from Amoy, China, have already been referred to *americana* by Mr. Harting (*l. c.*), and Dr. Bean has determined specimens from Plover Bay, Tschutski Peninsula, to belong to the same form.

Ornithology," wrongly applied the name given by Brehm to a North American species, the bird called *Actodromas fuscicollis* (VIEILL.) in current lists. He perpetuated his error in his Amer. Ornith. (1833), Compar. List (1838), and Catal. Method. (1842). This bird, which Schlegel in memory of the mistake called *Tringa bonapartei*, is therefore known in synonymies as *Tringa* or *Pelidna schinzii* BONAP. (*nec* BREHM), in contradistinction to the true *P. schinzii* of Europe. Probably being unaware of Schlegel's name, Brehm in 1855 (Naumannia, p. 292) bestowed a new name on the form misnamed by Bonaparte as *schinzii*, calling it *Pelidna americana*, and significantly adding in brackets "Tringa Schinzii *Bp.*" Brehm's *P. americana*, consequently, is only a synonym of *Tringa fuscicollis* VIEILL.

Three years afterwards J. Cassin, in "The Birds of North America," separated the American representative of the European Dunlin as *Tringa alpina* var. *americana* which Coues, in his Monograph of the Tringæ (Proc. Acad. Philada., 1861), raised to specific rank as *Pelidna americana* (CASSIN). From the explanation above it is evident, however, that this appellation is preoccupied, and another name is necessary. Fortunately there is no need of a new one, for Dr. Coues (*l. c.*) indicated *P. pacifica* as a separable form which has not later been recognized. I have myself examined his type (U. S. Nat. Mus., No. 9540), and finding it in every essential a true *P. americana* CASS. (*nec* BREHM), I propose to revive *pacifica* as the name for the Red-backed Sandpiper. *Pelidna alpina pacifica* is also a more fitting name, since it has been shown to inhabit both the Asiatic and the American shores of the Pacific Ocean.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Expos. culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89046	1087	Bering Island............	May 26, 1882	♂ ad.	208	122	55	36	27	23
89180	1106	......do....................	May 29, 1882	♂ ad.	192	110	50	32	25	22
92791	2100	......do....................	May 28, 1883	(♂) ad.	(193)	114	52	37	27	23
92792	2103	......do....................	May 28, 1883	(♂) ad.	(191)	113	53	36	27	24
89179	1105	......do....................	May 29, 1882	♀ ad.	210	118	53	36	26	23
92793	1690	......do....................	Oct. 22, 1882	♀	201	120	54	36	27	24

No. 89046.—Iris dark brown. Bill and feet olive black.

No. 92793.—Tip of middle claw reached 7^{mm} beyond the tip of tail, legs being stretched backwards, and the latter reached beyond the tips of folded wings for a similar distance.

The Red-backed Sandpiper visits Bering Island only while passing through during the spring and autumnal migrations. It arrives, together with other Sandpipers, in the latter part of May, but does not stay long.

44. Calidris arenaria (Lin.).

1766.—*Tringa arenaria* Lin., Syst. Nat., 12 ed., I, 251.—Middend., Sibir. Reis., II 2 (p. 219) (1853).—*Calidris a.* Leach, Syst. Cat. M. B. Br. Mus., p. 28 (1816).—Kittl., Denkw., I, p. 254.—Swinh., Ibis, 1860, p. 359.—*Id.*, *ibid.*, 1861, p. 342.—*Id.*, *ibid.*, 1863, p. 414.—*Id.*, *ibid.*, 1870, p. 363.—*Id.*, *ibid.*, 1875, p. 454.—*Id.*, P. Z. S., 1863, p. 315.—*Id.*, *ibid.*, 1871, p. 408.—Dybow. & Parvex, J. f. Orn., 1868, p. 338.—Dall. & Bannist., Tr. Chicag., Ac., I, 1869, p. 292.—Przew., Putesch., Ussuri (n. 168) (1870.—Taczan, Bull. Soc. Zool. France, 1876, p. 249.—*Id.*, Orn., Fauna Vost. Sibir., p. 52 (1877).—Finsch, Abh. Brem. Ver., III, 1872, p. 65.—Blakist. & Pryer, Ibis, 1878, p. 221.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 196.—*Iid.*, *ibid.*, X, 1882, p. 113.—Nelson, Cruise Corwin, p. 88 (1882.)—Blakist., Amend. List B. Jap., p. 11, (1884).

1766.—*Charadrius calidris* Lin., Syst. Nat., 12 ed., I p. 255.—*Trynga c.* Pall., Zoogr. Ross. As., II, p. 202 (1826).

1826.—*Trynga tridactyla* Pall., Zoogr. Ross. As., II, p. 198.

Rare during the migrating season. A single male was shot out of a small flock on Bering Island September 19, 1882. Iris dark brown. Bill and feet olive black. Total length, 186^{mm}; wing, 111^{mm}; tail-feathers, 49^{mm}; expos. culmen, 24^{mm}; tarsus, 24^{mm}; middle toe with claw, 17^{mm}.

45. Limosa lapponica baueri (Naum.).

1826.—*Limosa barge* Pall., Zoogr. Ross. As., II, p. 180 (*part*).

1834.—*Limosa baueri* Naum., Vög. Deutschl., VIII, p. 429.—Pelz., Wiener Sitzungsber., 1860, XLI, p. 326.

1844.—*Limosa lapponica* var. *novæ zelandiæ* Gray, Voy. Ereb. and Terr., B. (p. 13).—Nelson, Cruise Corwin, p. 89.

1844.—*Limosa australasiana* Gray, Grallæ Brit. Mus. (p. 95).

1847.—*Limosa novæ-zelandiæ* Gray, Gen. B., III, p. 570.

1848.—*Limosa foxii* Peale, U. S. Expl. Exp. B. (p. 231).

1848.—*Limosa uropygialis* Gould, P. Z. S., 1848, p. 38.—Swinh., Ibis, 1863, p. 409.—*Id.*, *ibid.*, 1870, p. 362.—*Id.*, *ibid.*, 1875, p. 453.—*Id.*, P. Z. S., 1863, p. 312.—*Id.*, *ibid.*, 1871, p. 406.—Baird, Tr. Chicag. Acad., I, 1869 (p 320), pl. 32.—Dall & Bann., *ibid.*, p. 293.—Finsch, Abh. Brem. Ver., III, 1872, p. 63.—Dall, Avif. Aleut. Isl. Unal. eastw., p. 4 (1873).—*Id.*, Avif. Aleut. Isl. west Unal., p. 6 (1874).—Taczan., Bull. Soc. Zool. France, 1876, p. 255.—*Id.*, *ibid.*, 1883, p 340.—*Id.*, Orn. Faun. Vost. Sibir., p. 1 (1877).—Blakist & Pryer, Ibis, 1878, p. 220.—*L. uropigialis Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 194.—Hartl., J. f. Orn, 1883, p. 279.—Palmén, Swed. Cat. Lond. Fish. Exh., p. 203 (1883).—Bogdan., Consp. Av. Ross., I, p. 87 (1884).

1849.—*Limosa rufa* Temm. & Schl., Faun. Jap. Av. (p. 114).—Bogdan., Consp. Av. Ross., I, p. 86 (1884).

1858.—*Limosa lapponica* Cassin, Pr. Acad. Philada., 1858, p. 196.—Swinh., Ibis, 1861, p. 409.—*Id.*, *ibid.*, 1863, p. 97.—*Id.*, *ibid.*, 1867, p. 388.—Blakist. & Pryer, Tr. As. Soc. Jap., X, 1882, p. 110.—Blakist., Amend. List B. Jap., p. 11 (1884).

1861.—*Gallinago punctata* Ellman, Zoologist, 1861 (p. 7470).

I see no reason for lumping the eastern and western forms of this species together, as they are fairly separable by the darker rump and heavier-barred flanks and axillaries of the former. As a rule *baueri* is paler than the typical *lapponica*, but a specimen from Bering Island, No. 92818, is fully as deeply colored as average European specimens, being, however, the darkest of an extensive series.

The name given by Naumann is undoubtedly older than those given by Gray or Gould. It is not a museum name only, as Naumann, when publishing it, indicated a character by which he thought it separable. That this character afterwards failed, does not invalidate the name; hence there is no good reason for rejecting it.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wings beyond tail.	Wing.	Tail-feathers.	Expos. culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89064	1158	Bering Island	June 4, 1882	♂ ad.	388	......	214	79	80	55	33
89065	1179	... do....	June 8, 1882	♂ ad.	388	......	222	81	81	55	37
89066	1180	....do................	June 8, 1882	♂ ad.	390	......	222	76	89	54	35
92818	2095	... do................	May 21, 1883	(♂) ad.	(376)	......	222	78	78	53	34
92817	2167	....do................	June 12, 1883	♂ ad.	372	17	213	79	78	55	34
92816	2796	....do................	Sept. —, 1883	....	......	......	213	74	86	56	36

No. 89064.—Iris dark brown. Bill blackish brown at tip, light reddish gray at base, especially light on both rami of the lower mandible. Feet uniform brownish black.

No. 89065.—Basal half of bill flesh-color, terminal half blackish brown.

No. 92817.—Bill blackish brown, brownish flesh-color at base below.

The Pacific Bar-tailed Godwit is a regular visitor to the Commander Islands during the migratory seasons. In 1883 I observed the first ones on the 10th of May on the sandy beach at Fedoskija, Bering Island, and specimens were obtained again during the latter part of September. While on Copper Island, in 1883, I saw one solitary bird at Glinka, about the middle of July, and another at Pestschanij on the 30th of the same month, so that it may be that a few remain to breed. It is, however, not uncommon among Arctic waters that individuals, not disposed to breed, stay at some more southerly locality during the whole summer.

Genus PSEUDOTOTANUS HUME.

Syn. =1878.—*Pseudototanus* HUME, Stray Feath., VI (p. 488).
=1884.—*Pseudoglottis* STEJNEGER, Zeitschr. Ges. Orn., I, 1884, p. 223.

Bill rather stout, long, longer than tarsus, culmen slightly recurved;

groove on the upper mandible only reaching the middle of the bill; lower mandible with a well-pronounced gonydeal angle. Malar apex reaching forward beyond the loral apex; mental apex reaching beyond the middle of the nostrils.

Feet not very long, moderately strong; tarsus longer than middle toe with claw, scutellate in front and behind; naked part of tibiæ about the length of the two basal articles of the middle toe, scutellate at the upper end, reticulate nearer to the titio-tarsal joint; outer and middle toes united by a large basal web, middle and inner ones by a smaller membrane, as large, however, as the usual web in Totanine birds between the outer and middle toes; border of the toes distinctly serrated.

Wings pointed, normally totanine; first primary longest.

Tail of normal length, square.

This genus, which originally was established by Hume, afterwards receiving by me the name *Pseudoglottis*, on account of the superficial resemblance of the type species to the type of Nilson's subgenus *Glottis*, belongs to a group of the Totanine waders characterized by the semipalmated toes, and takes a position somewhat intermediate between the genera *Terekia* and *Symphemia*. The basal webs are fully as well developed as in any of these recognized genera.

Though distinct from both these genera it seems perhaps somewhat nearer related to *Symphemia* than to *Terekia*, notwithstanding the fact that up to the present date the type species has been given as a synonym of the type of the latter genus.

The three genera may be easily recognized by the following

SYNOPSIS.

a^1. Bill extremely long, longer than tarsus plus the two basal articles of the middle toe; naked portion of tibiæ reticulate in front; feathering on the mental angle not reaching as far forward as the feathering of the forehead or the hind border of the nostrils; groove on the upper mandible long, reaching almost to the tip .... *Terekia.*

a^2. Bill never longer than tarsus plus the first basal article of the middle toe; naked portion of tibiæ scutellate in front above; feathering on the mental angle reaching far in front of the feathering of the forehead and beyond the middle of the nostrils; groove on upper mandible does not reach beyond the middle the bill.

  b^1. Culmen recurved, longer than tarsus .... *Pseudototanus.*

  b^2. Culmen straight, shorter than tarsus .... *Symphemia.*

46. Pseudototanus guttifer (NORDM.).

1835.—*Totanus guttifer* NORDMANN in Erman's Verzeichn. Thier. Pflanz, Reis. Erde, p. 17.

1854.—*Xenus guttifer* LICHTENSTEIN, Nomencl. Mus. Berol., p. 91.

1856.—*Terekia guttifera* BONAPARTE, Compt. Rend., XLIII, p. 597.
1876.—*Totanus haughtoni* ARMSTRONG, Stray Feath., IV (p. 344).—HARTING, Ibis, 1883, p. 133, pl. iv.
1878.—*Pseudototanus haughtoni* HUME, Stray Feath., VI (p. 488).—*Id.*, Game B., India, III (p. 403), (1880).
1884.—*Pseudototanus guttifer* STEJNEGER, Zeitschr. Ges. Orn., I, 1884, p. 223, pl. x.

A new specific name was prepared for this bird besides the new generic term, as I had not been able to find any description which would fit. Nor could I in any list detect any recognized species which it could possibly be. Swinhoe's lists of Chinese birds, Blakiston's of those from Japan, and Taczanowski's papers on the avifauna of Eastern Siberia did not contain any name with which it could be identified. Even Gray's "Hand list" and Schlegel's "Scolopaces, Mus. P. B." failed. Thinking it rather improbable, however, that so conspicuous a form should have escaped detection, as it, by no means, could be regarded as a form of restricted local occurrence, I, as a last refuge, went through all the synonyms of Totanine birds given in the "Hand list." In going through the synonymy of *Terekia cincrea* I was struck by the suggestive name *guttifera* NORDM.

A specimen of *Terekia cinerea* was then lying on the table before me, but a glance at its dark uropygium, the gray neck slightly streaked with dusky, its whole coloration and small size as compared with the white rump and lower back, rounded black spots on the breast, the blackish mottled coloration of the upper parts and the much superior size of my bird, which is nearly as large as *Totanus nebularius* (= *glottis* BEHST.), made the idea of a confusion of these two species appear so absurd that I proceeded further on through the list. As I did not succeed in finding what I looked for, I once more returned to *Terekia cinerea* and its synonym *guttifera*. The latter name seemed to me so inappropriate to the Terek Sandpiper that I sent to the library for Erman's "Naturhistorischer Atlas," although I did it more in order to convince myself than with the hope of finding the original description of my bird.

Nevertheless, v. Nordmann's description proved to belong to it. It was my good luck to revive this very distinct form (so distinct that it constitutes the type of a new genus) after having been forgotten almost completely for forty nine years.

As already indicated, its resemblance to *Terekia* is so slight that no further comparison is needed. In general style it somewhat resembles *Totanus nebularius* (*glottis* BECHST.), and if specimens have been collected since Erman's time they have, in all probability, been confounded with the latter species. A closer comparison will soon show how different they are.

(1) In *T. nebularius* only the outer toe is united with the middle one by a membrane; in *Ps. guttifera* both the outer and the inner toes are united with the middle one by large webs.

(2) In *T. nebularius* the tarsus is longer than the exposed culmen, while in *guttifera* the tarsus is much shorter than the culmen.

(3) In *T. nebularius* the naked part of the tibia is equal to the middle toe without claw; in *Ps. guttifera* it is much shorter, scarcely exceeding the two basal joints of the middle toe.

It will thus be seen that *T. nebularius* stands much higher on its legs than *Ps. guttifera.*

(4) In *T. nebularius* the bill is much more slender; the gonys without any distinct angle; malar apex of the feathering on the lower mandible does not extend in front of the loral apex of the feathering on the maxilla. *Ps. guttifera* has a much stouter bill, broader and higher at the base; at the beginning of the symphysis the gonys forms a distinct angle; the malar apex extends in front of the loral apex.

(5) In *T. nebularius* the under wing-coverts are gray or white, barred or edged with dusky, while in *Ps. guttifera* all the under wing-coverts are pure white.

(6) In *T. nebularius* the tail-feathers are white, except the two middle ones, which are gray, and all more and less transversely banded or mottled with dusky, except the lateral ones, which are nearly uniform white. In *Ps. guttifera* all the tail-feathers are light gray, with a narrow submarginal border of a somewhat darker gray, but without any transverse spots or bars.

(7) In *T. nebularius* the fore neck and throat are finely streaked with small lanceolate blackish stripes, and the breast white, unspotted. In *Ps. guttifera* the fore neck and throat are similarly but less densely streaked, while the breast is dotted with large rounded black spots.

Besides these there are many other differences. *T. nebularius* is considerably larger, the white of the lower part of the back reaches much higher up on the back, the coloration of the dark parts of the upper surface is different, &c., but the differences pointed out above will be sufficient to convince the most skeptical that the two species are distinct, and will enable anybody to separate them with the greatest ease.

A comparison of the original description of v. Nordmann[*] with that of my bird given below will prove the correctness of my identification.

Description. ♂ *ad.—U. S. Nat. Mus. No.* 92808, *L. Stejneger No.* 2088. *Bering Island May* 22, 1883.

Upper parts of the body, except the rump, blackish brown more and less edged with whitish, as the white edges are differently worn away; thus the crown is almost uniform brownish black with a few white streaks; the neck is more uniformily and finely streaked longitudinally, while on the back the light edges become broader backward; in many feathers on the latter part the whitish edges have the inner border waved or indented, the outline of the feathers by abrasion being correspondingly scalloped. Among the dark feathers, and mostly concealed by these, are left a number of uniform sandy gray feathers, the remainder of the winter plumage. The other parts of the body are white; the rump and the middle of abdomen unspotted; sides of the head and neck, forehead, and superciliaries heavily streaked with blackish, most densely on the lores; chin with a few faint roundish spots, throat and foreneck strongly marked with terminal, somewhat lanceolate, streaks; on the jugulum and the breast the spots become subterminal, broadening so as to form rather large rounded drops with a somewhat flattened basal border; on the anterior half of the flanks the spots are still broader, almost assuming the character of cross-bars. Primaries blackish brown, from the seventh lighter, brownish ash, as are also the secondaries, and with white edges, which gradually become broader on the interior web of the secondaries the nearer they are to the body; white edges on the tertials with indented borders and the feathers scalloped; primary coverts with only a very narrow white terminal edge, the other upper wing-coverts with rather broad white edges, shafts of the primaries brown, mesially lighter; that of the first one wholly white; all under wing-coverts uniform pure white. Tail light ashy gray, whitish at the base, and indistinctly mottled with darker gray along the edges which are whitish; the mottlings hardly visible on the middle pair; shafts of rectrices white, even those of the middle pair; upper tail-coverts white, submarginally marked with dusky; under tail-coverts white with two or three small and irregularly placed dark spots or streaks.

Total length, 287^{mm}; wing, 173^{mm}; tail-feathers, 67^{mm}; exposed culmen, 53^{mm}; tarsus, 43^{mm}; middle toe with claw, 35^{mm}.[†]

A single specimen was shot on Bering Island on the 22d of May, 1883, during my absence in Kamstchatka. It was prepared by my faithful Nicanor, one of the natives, whom we usually styled "the professor." At the same time, two days later, I myself shot another specimen on the delta of the Avatscha River, Kamtschatka, but unfortunately it was so damaged as to be completely unfit for preparation. It is most likely, however, that the bird may hereafter be observed more frequently, attention having once been called to it, as very likely it has often been confounded with the Greenshank.

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[*] As this description may be difficult for many ornithologists to consult, a reproduction is herewith given:

124. *Totanus guttifer. Nov. spec. Supra fuscogriseus, sparsim albido-maculatus; collo pectoreque albis, nigro-guttatis; cauda alba, obsolete griseo-signata.*

Ausmessung: Länge 12″, Länge des Schnabels vom Mundwinkel beinahe 2″, Höhe des Schnabels an der Wurzel 3‴, Länge der Flügel 6″ 3‴, Länge des Schwanzes 2″ 3‴, Höhe der Ferse 1″ 9‴, Länge der Mittelzehe 1″, Länge der Hinterzehe beinahe 3‴.

Am nächsten mit *Tot. glottis* verwandt, doch ist unser Vogel kleiner, der Schnabel stärker, zur Spitze nach oben gebogen die Schwimmhaut zwischen den Zehen und die Füsse bedeutend kürzer. Oberkörper grau, mit sparsamen weisslichen Flecken. Auf dem Kopf und Nacken strichförmige, auf der weissen Kehle, dem Vorderhals und der Brust grosse schwarze, tropfenartige Flecken; Schnabel schwarz. Unterkörper beinahe einfarbig weiss, die spitzen über den Schwanz hinausreichenden Schwingen schwärzlich; mittlere Schwanzfedern mit grösseren schwärzlichen Abzeichen.

Das vorliegende Exemplar dieser sehr ausgezeichneten Art wurde in der Umgegend von Ochozk im Monat Juli von *Erman* erlegt. In der Sammlung der Akademie der Wissenschaften zu St. Petersburg befinden sich zwei Individuen, welche wahrscheinlich aus derselben Gegend sind. (Nordmann, in Erman's Verz. Thier. Pflanz. Reise um die Erde, p. 17.)

[†] This measurement disagrees greatly with that given by Nordmann, 1 inch, this latter being probably only a misprint.

Besides the specimens from Okotsk, mentioned by v. Nordmann, no occurrence of this most interesting form has been reported from Northern and Northeastern Asia, as far as I am aware of. It will probably be found in all the coast districts of Eastern Asia during the migrations.

47. Totanus nebularius (Gunn.).

1769.—*Scolopax nebularius* Gunner., in Leem, Lapp. Beskr., p. 251.—*Totanus n.* Stejneger, Pr. U. S. Nat. Mus., 1882, p. 37.—*Id.*, *ibid.*, 1883, p. 71.—*Id.*, Naturen, 1884, p. 9.

1787.—*Scolopax glottis* Lath., Synops. Suppl., p. 292 (*nec* Lin., *quæ Limosa lapponica*).—*Totanus g.* Middend., Sibir. Reise, II, 2 (p. 213) (1853).—Cassin, Pr. Acad. Philada., 1858, p. 196.—Schrenck, Reis. Amurl, I, p. 414 (1860).—Radde, Reis. Süd. Ost-Sibir., II (p. 427) (1863).—Swinh., Ibis, 1863, p. 406.—*Id.*, *ibid.*, 1870, p. 364.—*Id.*, *ibid.*, 1875, p. 453.—*Id.*, P. Z. S., 1863, p. 311.—*Id.*, *ibid.*, 1871, p. 405.—Dybow. & Parvex, J. f., Orn., 1868, p. 337.—Taczan., J. f. Orn., 1873, p. 102.—*Id.*, *ibid.*, 1874, p. 336.—*Id.*, Bull. Soc. Zool. France, 1876, p. 250.—*Id.*, *ibid.*, 1882, p. 397.—*Id.*, Orn. Faun. Vost. Sibir., p. 1 (1877).—Blakist. & Pryer, Ibis, 1878, p. 220.—*Iid*, Tr. As. Soc. Jap., VIII, 1880, p. 193.—*Iid.*, *ibid.*, X, 1882, p, 109.—Blakist., Amend. List B. Jap., p 36, (1884).

1831.—*Totanus glottoides* Vigors, P. Z. S., 1831, p. 173.—Swinh., Ibis, 1860, p. 66.—*Id.*, *ibid.*, 1861, p. 343.

I have had some doubts whether the Greenshank from Eastern Asia ought not to stand as *Totanus nebularius glottoides*, but not having sufficient material, I, at present, abstain from taking such a step. As far as I now can see, there is no difference in size, but it seems as if the eastern birds have the rump and the axillaries more heavily barred than the western ones, though I am bound to say that one of my birds from Bering Island has the axillaries pure white.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail feathers.	Exposed culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89067	1075	Bering Island..............	May 23, 1882	♂ ad.	318	178	79	54	59	36
92809	2089	......do	May 23, 1883	(♂) ad.	(321)	180	72	51	60	35
92807	2086	......do	May 20, 1883	(♀) ad.	(341)	192	77	56	61	37
89068	1195	......do	June 6, 1882	♀ ad.	344	102	81	52	57	36

No. 89067.—Iris dark brown. Bill blackish brown, lighter brownish gray towards the base, especially on the lower jaw. Feet yellowish gray, joints bluish.

No. 89068.—Bill blackish brown, basal half lighter, on upper mandible with a bluish, on lower one with a reddish, gray tinge. Feet dirty olive-gray, joints darker, more bluish gray.

The Greenshank occurs regularly on Bering Island during the spring migration, but does not breed there as far as I know of.

I also found them rather numerous on the delta of Avatscha River, Kamtschatka, in the latter part of May, 1883.

48. Totanus ater (Sander).

1766.—*Scolopax fusca* LIN., Syst. Nat., 12 ed., I, p. 243 (*nec* 1758, quæ *Guara alba.*).—*Limosa f.* PALL., Zoogr. Ross. As., II, p. 187.—*Totanus f.* MIDDEND., Sibir. Reis., II, 2 (p. 214) (1853).--SWINH., Ibis, 1862, p. 254.—*Id.*, *ibid.*, 1863, p. 97.—*Id.*, *ibid.*, 1875, p. 453.—*Id.*, P. Z. S., 1862, p. 319.—*Id.*, *ibid.*, 1863, p. 311.—*Id.*, *ibid.*, 1870, p. 427.—*Id.*, *ibid.*, 1871, p. 406.—RADDE, Reis. Süd. Ost-Sibir., II (p. 327) (1863).—DYBOW. & PARVEX, J. f. Orn., 1868, p. 337.—PRZEW., Putesch. Ussur. (n. 160) (1870).—TACZAN., J. f. Orn., 1873, p. 102.—*Id.*, *ibid.*, 1874, p. 336.—*Id.*, Bull. Soc. Zool. France, 1876, p. 250.—*Id.*, *ibid.*, 1883, p. 339.—*Id.*, Orn. Faun. Vost. Sibir., p. 54 (1877).—BLAKIST. & PRYER, Ibis, 1878, p. 220.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 193.—*Iid.*, *ibid.*, X, 1882, p. 110.—BLAKIST., Amend. List B. Jap., p. 11 (1884).—BOGDAN., Consp. Av. Ross., I, p. 96 (1884).

1779.—*Scolopax atra* SANDER, Naturforsch., XIII (p. 193).

In the tenth edition Linnæus described the young of *Guara alba* as *Scolopax fusca*, basing it upon Catesby's "Nat. Hist. Carolin., plate 83." In the twelfth edition he applied the identical name, *Scolopax fusca*, to quite a different bird, the European Dusky Sandpiper, usually known as *Totanus fuscus*. It therefore has become necessary, according to the A. O. U. rules, to adopt the name next in date, which, fortunately, is a very appropriate one.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Exposed culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm*	*mm.*	*mm*
92810	2085	Bering Island	May 20, 1883	(♂) ad.	(303)	156	49	54	53	35
92812	2069	do	May 20, 1883	(♀) ad.	(329)	162	68	61	58	40
92811	2097	do	May 20, 1883	(♀) ad.	(304)	159	69	56	55	37

During my absence from Bering Island in the spring of 1883 three specimens in summer plumage were shot and prepared. The species may be regarded as a rather rare visitor, as it was not known to any of the residents on the islands. Like so many other rare migrating visitors to Bering Island in the spring of 1883, its appearance probably was due to the abnormal amount of snow in Kamtschatka at that time.

49. Totanus glareola (Lin.).

1758.—*Tringa glareola* Lin., Syst. Nat., 10 ed., I, p. 149 (*nec* Pall., 1826).—*Totanus g.* Temm., Man. d'Orn., 1 ed. (p. 421) (1815).—Temm. & Schl., Faun. Jap. Av. (p. 110) (1849).—Middend., Sibir. Reis., II, 2 (p. 215) (1853).—Schrenck, Reis. Amurl., I, p. 416.—Swinh., Ibis, 1860, p. 66.—*Id.*, *ibid.*, 1861, p. 343.—*Id.*, *ibid.*, 1863, p. 407 (1860).—*Id.*, *ibid*, 1870. p. 363.—*Id.*, *ibid*, 1874, p, 458.—*Id.*, P. Z. S., 1863, p. 311.—*Id.*, *ibid.*, 1871, p. 406.—Radde., Reis. Süd. Ost-Sibir., II (p. 324) (1863).—Whitely, Ibis, 1867, p. 205.—Dybow. & Parvex, J. f. Orn., 1868, p. 337.—Przew., Putesch. Ussur (n. 162).—Taczan., J. f. Orn., 1873, p. 102.—*Id.*, *ibid.*, 1874, p. 336.—*Id.*, Bull. Soc. Zool., France, 1876, p. 251.—*Id.*, *ibid.*, 1883, p. 339.—*Id.*, Orn. Faun. Vost. Sibir., p. 54 (1877).—Blakist. & Pryer, Ibis, 1878, p. 220.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 194.—*Iid.*, *ibid.*, X, 1882, p. 110.—Stejneger, Pr. U. S. Nat. Mus., 1883, p. 71.—Blakist., Amend. List B. Jap., p. 36 (1884).

1822.—*Totanus affinis* Horsf., Tr. Linn. Soc., XVIII (p. 191).—Swinh., P. Z. S., 1863, p. 311.—*Id.*, Ibis, 1866, p. 294.

1866.—*Tryngа littorea* Pall., Zoogr. Ross. Asiat., II, p. 195.

The specimens collected by me have been compared with a fair series of birds from China, India, and Europe, and found to be identical.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing beyond tail.	Wing.	Tail-feathers.	Expos. culmen.	Tarsus.	Middle toe with claw.
					mm.	mm.	mm.	mm.	mm	mm.	mm.
89082	1182	Bering Island.......	June 6, 1882	♂ ad.	214	.....	122	53	26	37	31
92802	2692	......do..............	May 23, 1883	(♂)ad.	(215)	..	120	53	28	37	31
92803	2166	......do..............	June 12, 1883	♂ ad.	217	0	123	52	29	38	30
89079	1064	......do..............	May 21, 1882	♀ ad.	218	....	121	51	30	39	32
89080	1092	......do..............	May 29, 1883	♀ ad.	226	.....	120	52	30	40	35
89081	1148	......do..............	June 3, 1882	♀ ad.	228	......	123	54	27	37	31

No. 92803.—Iris dark brown. Bill blackish olive; below at base, lighter brownish olive. Feet, light grayish olive. Very lean.

No. 89079.—Feet greenish to yellowish olive; lower part of tarsus and toes with a tinge of bronzy brown.

No. 89080.—Feet greenish yellow.

This species is a rather common one on Bering Island, breeding on the great swamps of the northern part and in the broader and deeper valleys, for instance in Kamennij, Staraja Gavanskij Pad, &c. They arrive after the middle of May, and their musical performances or "playing" was often watched by me during the latter part of the month.

This sandpiper was not observed on Copper Island, where in fact few or no suitable places for it are found.

50. Actitis hypoleucos (Lin.).

1758.—*Tringa hypoleucos* Lin., Syst. Nat., 10 ed., I, p. 149.—*Actitis h.* Boie, Isis, 1822, p. 560.—Middend., Sibir. Reise, II, 2 (p. 215) (1853).—Schrenck, Reis. Amurl., I, p. 417 (1860).—Radde, Reis. Süd. Ost-Sibir., II (p. 320) (1863).—Schleg., Mus.P. B. Grallæ, p. 80 (1865).—Dybow. & Parvex, J. f. Orn., 1868, p. 337.—Przew., Putesch. Ussur. (n. 163).—Taczan., J. f. Orn., 1873, p. 102.—*Id.*, *ibid.*, 1874, p. 336.—*Id.*, Bull. Soc. Zool. France, 1876, p. 250.—*Id.*, *ibid.*, 1883, p. 339.—*Id.*, Orn. Faun. Vost. Sibir., p. 53 (1877).—*Tringoides h.* Swinh., Ibis, 1860, p. 66.—*Id.*, *ibid.*, 1861, p. 343.—*Id.*, *ibid.*, 1862, p. 259.—*Id.*, *Ibid.*, 1863, p. 408.—*Id.*, *ibid.*, 1870, p. 363.—*Id.*, *ibid.*, 1874, p. 163.—*Id.*, *Ibid.*, 1875, p. 453.—*Id.*, P. Z. S., 1863, p. 312.—*Id.*, *ibid.*, 1871, p. 406.—Blakist. & Pryer, Ibis, 1878, p. 220.—*Iid.*, Tr. As. Soc., Jap., VIII, 1880, p. 194.—*Iid.*, *ibid.*, X, 1882, p. 110.—Stejneger, Pr. U. S. Nat. Mus., 1883, p. 71.—Blakist., Amend. List B. Jap., p. 36 (1884).

1826.—*Trynga leucoptera* Pall., Zoogr. Ross. As., II, p. 196.

It is true that Illiger united in his genus *Actitis* both *Limosa*, *Totanus*, *Tringa*, *Pavoncella*, and the bird of the present genus, but there is no more reason for dropping his name altogether than for disregarding Linnæus's *Tringa*, and there are no more reasons for quoting "*Actitis* Boie *nec* Illiger" than for "*Tringa* Baird *nec* Lin." Illiger (Prod. p. 262) enumerates as species of his genus *Actitis*: "Scolopax Limosa, Totanus, Tringa pugnax, Hypoleucos *Lin.*" Of these the two first had already, by earlier writers, been separated as types of *Limosa* and *Totanus*, leaving in 1811 *Tringa pugnax* and *hypoleucos* the occupants of the restricted genus *Actitis*. In 1816, Leach established the genus *Pavoncella* for the former of these two species, so that *hypoleucos*, by elimination, has become the only type of *Actitis* Illig., to the exclusion of *Tringoïdes* Bonap., 1831,* which is a pure synonym of *Actitis*.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Expos. culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89041	1553	Bering Island......	Sept. 9, 1882	♂	203	......	104	53	25	25	23
92805	2091	......do..............	May 22, 1883	(♂) ad.	(187)	......	103	54	25	25	24
92804	2101	......do..............	May 24, 1883	(♂) ad.	(188)	......	104	57	24	24	23

No. 89041.—Iris dark brown. Bill dark brownish gray, blackish toward tip, reddish at base of lower mandible. Feet light gray with a faint tinge of yellowish green.

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* Saggio Distr. Meth. Anim. Vertebr., p. 58.

The common sandpiper occurs on Bering Island only during the migrations, in spring and autumn, but seems to be rather rare, and the three specimens collected were the only ones seen.

51. Terekia cinerea (GÜLD.).

1774.—*Scolopax cinerea* GÜLDENST., N. Comm. Acad. Petrop. (XIX, p. 473, tab. xix.)—*Limosa c.* MIDDEND., Sibir. Reis., II, 2 (p. 216) (1853).—SCHRENCK, Reis. Amurl., I, p. 419, (1860).—RADDE, Reis. Süd. Ost Sibir., II (p. 330) (1863).—*Terekia c.* GRAY, List Gen., p. 88 (1841).—SWINH., Ibis, 1863, p. 97.—*Id.*, P. Z. S., 1863, p. 312.—*Id.*, *ibid.*, 1871, p. 406.—DYBOW. & PARVEX, J. f. Orn., 1868, p. 337.—TACZAN., J. f. Orn., 1873, p. 102.—*Id.*, *ibid.*, 1874, p. 336.—*Id.* Bull. Soc. Zool. France, 1876, p. 250.—*Id.*, Orn. Fauna Vost. Sibir., p. 53 (1877).—BLAKIST. & PRYER, Tr. As. Soc. Jap., X, 1882, p. 110.—BLAKIST., Amend. List B. Jap., p. 36 (1884).—SEEB., Ibis, 1884, p. 33.

1822.—*Totanus javanicus* HORSF., Tr. Linn. Soc., XIII, p. 327.—*Terekia j.* SWINH., P. Z. S., 1862, p. 319.

1826.—*Limosa recurvirostra* PALL., Zoogr. Ross. As., II, p. 181.

The only specimen of the Terek Sandpiper or Godwit was secured on one of the last days before I left Bering Island.

It was a male, shot near Ladiginsk, Bering Island, on the 9th of September, 1883. Iris blackish brown. Bill blackish olive; yellowish olive at base of both mandibles. Feet, including webs, bright orange yellow. Total length, 231^{mm}; wings beyond tail, 2^{mm}; wing, 125^{mm}; tail-feathers, 52^{mm}; exposed culmen, 39^{mm}; tarsus, 26^{mm}; middle toe with claw, 21^{mm}.

52. Heteractitis incanus (GM.).

1788.—*Scolopax incana* GMEL., Syst. Nat., I, p. 658.—*Heteroscelus i.* COUES in Elliott's Affairs Alaska, p. 187 (1875).—ELLIOTT, Monogr. Seal Isl., p. 130 (1882).—BEAN, Pr. U. S. Nat. Mus., 1882, p. 165.—NELSON, Cruise Corwin, p. 89 (1883).—*Actitis i.* FINSCH, Abh. Brem. Ver., III, 1872, p. 64.—*Heteractitis i.* STEJNEGER, Auk, 1884, p. 236.—TURNER, Auk, 1885, p. 157.

1826.—*Trynga glareola* var. PALL., Zoogr. Ross. As., II, p. 194.—KITTL., Denkw., I, p. 287 (1858).

1831.—*Totanus pedestris* LESSON, Tr. d'Orn., p. 552 (*part*).

1841.—*Totanus fuliginosus* GOULD, Zool. Voy. Beagle, Birds, p. 130.

1844.—*Scolopax undulata* FORSTER, Descr. Anim. (p. 173).

1844.—*Scolopax pacifica* FORSTER, Descr. Anim. (p. 173).

1847.—*Totanus oceanicus* LESSON, Compl. Oevr. Buff. (p. 244).

1848.—*Totanus polynesiæ* PEALE, U. S. Expl. Exp. (p. 237).

1858.—*Heteroscelus brevipes* BAIRD, B. North Amer., p. 734, pl. 88 (*nec* VIEILL.).—*Id.*, Tr. Chicag. Acad., I, 1869 (p. 734).—DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 293.—*Tringa b.* KITTL., Denkw., I, p. 258.

It was most unfortunate that Cassin, in 1858, united *H. incanus* with *brevipes*, which he had previously so well distinguished, and it is still more unfortunate that he has been followed almost unanimously by later authors. I propose to prove that there exists two well-defined species, distinguishable both by structural characters and by differences in color, distinguishable in all plumages, adults and young, summer and winter specimens.

The reason why Cassin failed to maintain the distinction between the two species was partly that he overlooked the structural differences, partly that he mistook the adult barred summer plumage for that of the young, while it is the young plumage which he regarded as the breeding dress.

If the ornithologists interested in this question will place before them their specimens, or series of specimens, I would propose to them to measure the length of the nasal groove from the loral apex of the feathering to the foremost end of the furrow. Specimens in which the groove is as long as about two-thirds of the length of the exposed culmen from the feathering, belong to *Heteractitis incanus;* specimens in which this groove is only half as long as the exposed culmen are true *H. brevipes.* If the collection is large enough we will find, when dividing it into two series, according to the above character, that each of these contain specimens, some of which are distinctly barred underneath, partially or wholly, others being only more or less uniformly clouded with gray on fore neck, throat, and flanks. If now comparing the barred specimens of both series, we will find the following differences in color: In those with the long nasal groove, *incanus*, the whole under surface, including middle of abdomen and under tail-coverts, is distinctly and uniformly barred with blackish gray, and the back is purer gray; in the specimens with the short groove the middle of the abdomen and the under tail-coverts are pure white, the dark bars on the other part being lighter and finer, while the back is more tinged with brownish. Upon taking measurements we will find that the long-grooved, heavy-barred *incanus* average larger than the short-grooved, lighter *brevipes.*

If we now compare the two series of unbarred specimens we will find that the long-grooved ones are purer gray and average larger (*incanus*) than the short-grooved ones, which are appreciably browner and smaller.

Anybody taking the trouble of still closer examining his specimens will soon find additional characters, and will especially appreciate the distinct and regular white bars—two or more on each feather—on the upper tail-coverts of the unabraded plumage, in *brevipes*, in contradistinction to those in *incanus*, in which these feathers are either uniform gray or with a very narrow light edging.

These facts ought now to convince the most skeptical of the validity of the two species. To those who have got no material, or only an insufficient series, I would say that the above process was the one followed by me in handling my series, and that the characters are pertinent and without the slightest sign of intergradation throughout the whole lot of more than twenty specimens, while the table of dimensions below conclusively prove the points above alluded to.

It is a matter of regret to me that so many of the labels of the unbarred birds in my series have no definite data as to the exact time of their capture. Nevertheless I think it pretty clearly established by the facts, accessible to me, that the barred plumage is the full adult breeding plumage, while the clouded under side represents the young bird of the year, and possibly the adults during the four months from December to March. It is furthermore clear from an inspection of the specimens that there is no sexual difference either in color or dimensions. No. 87243, collected on the Fiji Islands in "winter," shows some new feathers with bars, and v. Pelzeln (Novara Exp., p. 130) mentions a specimen from Tahiti, shot on the 25th of February, which most probably is a true *incanus* in transition to the barred plumage.*

Turning to the question of the geographical distribution of the two species we already, at the outset, feel the mischief done by the untimely "lumping," as in many cases where no description is given, it is impossible to tell which bird more recent authors have had before them.

It may, however, be stated at once that *H. brevipes*, the short-grooved species with the white under tail-coverts in the adult summer plumage, does not occur in America or in any of the outlying islands belonging to that continent. All the specimens from Alaska and the Aleutian Islands, down to California, belong to *H. incanus*, and so does the bird from the Galapagos Islands (Gould's *T. fuliginosus*).

This species, *incanus*, also occur in the greater part of the Polynesian Islands, especially the more eastern ones. As I have already said, it is very difficult to trace the habitat with certainty, as most authors have confounded the two species, and only a few have given short notes as to the coloration or size of their specimens. The following references seem, however, to belong to the present species, the heavy-barred bird: Paumotu Islands (Peale); Marquesas Islands (Lesson); Tahiti (v. Pelzeln, Forster); Tongatabu (Forster); Palmyra (Streets); Samoa, Upolu, and

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* His specimen from Ualan is certainly *brevipes*, and so is probably that from Puynipet.

Savai (Hartlaub, Finsch); Fiji (Peale, Walden). This is probably also the species occurring on the Hawaiian Islands. It may also be remarked that a bird recorded by Finsch and Hartlaub from the Pelew Islands seems to belong here.

The true *brevipes*, on the other hand, is a more Asiatic species, to which is referable all or most of the records from Kamtschatka, Japan, Okotsk, Baikal, Bonin Islands, Liu-Kiu Islands, Formosa, China, Philippine Islands, probably also the Marianne and the Caroline Islands,* from Borneo, Timur, Ceram, and Australia.

Comparative table of dimensions.

I.—HETERACTITIS INCANUS.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex.	Wing.	Tail-feathers.	Expos. culmen.	Length of nasal groove.	Tarsus.	Middle toe with claw.
						mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
82430*	Belding..	......	Cerros Island, Cal...	Apr. —, 1881	♀	170	73	37	27	33	31
*	Cooper ..	71	Shoalwater Bay, W. T.	May 9, 1854	♀	106	74	39	26	34	31
73441*	Nelson ..	3	Sannak Isl., Alaska.	May 15, 1877	♀	173	77	38	26	35	31
54602*	Dall	1649	Nulato, Alaska	May 27, 1868	♂	167	73	38	25	34	31
92813*	Stejneger	2066	Bering Island.......	May 29, 1883	(♂)	161	77	39	26	33	31
92814*	... do	2067	....do...............	May 29, 1883	(♂)	165	73	37	24	33	31
89077*	... do	1140	....do...............	June 1, 1882	....	164	74	35	22	34	32
89078*	....do	1141	... do...............	June 1, 1883	♂	172	78	39	25	34	31
64272*	Elliott ...	......	St. George I., Alaska.	July 29, 1873	....	172	77	38	25	33	31
87244*	Goward..	......	Fiji Islands	Summer.....	....	177	77	39	24	35	31
15724	Peale † ..	......	....do	....	♂	180	79	42	28	35	32
89646‡	Bendire..	54	Fort Klamath, Oreg.	Aug. 25, 1882	♀	163	70	36	24	34	29
92815‡	Stejneger	1647	Bering Island	Sept. 20, 1882	♂	161	68	37	24	32	30
67321‡	Streets ..	12	Palmyra Island	(Dec.)	....	161	72	38	26	34	31
87243‡	Goward..	......	Fiji Islands..........	Winter......	....	165	80	32	24	34	31
‡	Nelson...	1292	Alaska	....	....	170	80	38	25	35	32
75831‡	....do ...	475	....do...............	....	♂	168	78	36	23	34	31
21432‡	Gruber ..	21432	Farallones, California.	....	....	166	80	38	24	34	30
	Average measurements of eighteen specimens					168	76	38	25	34	31

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* Cf. Finsch's statement about the birds collected by him on the Eastern Carolines, the Marshall, and Gilbert Islands: "Die Verfärbungsverhältnisse sind sehr auffallend, da Exemplare Mitte Juni noch keine Spur eines Sommerkleides zeigen." (Vög. d. Südsee, p. 56 (1884)). Of course, the summer plumage which Finsch expected to see is that of *incanus*, while the specimens in question belong to *brevipes*!

Comparative table of dimensions—Continued.

II.—HETERACTITIS BREVIPES.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex.	Wing.	Tail-feathers.	Expos. culmen.	Length of nasal groove.	Tarsus.	Middle toe with claw.
						mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
15819§	Heine	51	Hakodadi	May —, 1854	..	160	69	34	16	35	.....
89076§	Stejneger	1089	Bering Island	May 28, 1882	♂	160	69	37	18	33	30
67301§	Bernstein	10271	Halmaheira	Nov. —, 1861	♂	165	67	39	19	33	30
91400‡	Jouy	783	Matsumoto, Japan	Nov. 15, 1882	♀	154	63	35	17	34	30
21226‡	Rogers	γ177	Bonin Islands	....	....	164	66	36	19	33	30
	Average measurements of five specimens‖					161	68	36	18	34	30

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*Specimens with the whole under surface, including under tail-coverts uniformly barred with dark gray.

† Type of *Totanus polynesiæ* PEALE.

‡ Specimens without bars underneath.

§ Specimens barred on fore neck, throat, and flanks.

‖ For additional specimens received after the table was prepared, see under the following species.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Expos. culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89077	1140	Bering Island	June 1. 1882	....	267	164	74	35	34	32
89078	1141	......do	June 1, 1882	♂ ad.	286	172	78	39	34	31
92813	2066	......do	May 27, 1883	(♂) ad.	(270)	161	77	39	33	31
92814	2067	......do	May 29, 1883	(♂) ad.	(268)	165	73	37	33	31
92815	1647	......do	Sept. 20, 1882	♂ jun.	256	161	68	37	32	30

No. 89077.—Iris dark brown. Bill brownish black, lighter brownish gray at base of lower mandible. Feet ocher yellow, with a faint greenish tinge on the joints.

No. 92815.—Iris dark brown. Bill olive gray, blackish at tip. Feet yellow, with a faint greenish tinge; nails black.

The Wandering Tattler, the "Tschornij Kulik" of the Russians, comes to the islands during the latter part of May, and may then be met with on the stony beaches close to the water's edge, in pairs or in very small troops. At the time of their arrival they are less shy than totanine birds generally, but their conduct changes after awhile, so that I only once, on Copper Island, in the middle of July, observed a single specimen during the summer, although I feel suspicious that they breed there.

This bird makes quite a different impression on the observer from the other totanine waders, and its habits seem to be rather peculiar, in many respects reminding one of the Oyster-catcher. It carries its body much in the same manner as *Actitis hypoleucos*, but very seldom flirts its tail up and down like the latter, nor has it as much of the peculiar movement of the head and neck as the common sandpiper. It is a much more quiet bird, very often standing immovable for a long while staring down into the water. Its flight is graceful and very rapid. Its voice loud and harsh, almost screaming. I only met it among rocks and stones, seldom, if ever, on the sandy or gravelly beaches.

53. Heteractitis brevipes (Vieill.).

1817.—*Totanus brevipes* Vieill., N. Dict. d'Hist. Nat., VI, p. 410.—Cassin, Exp. Jap. Perry, II, p. 229 (1857).—*Id.*, U. S. Expl. Exp., p. 339 (1858).—*Id.*, Pr. Acad. Philada., 1858, p. 195.—*Id.*, *ibid.*, 1862, p. 321.—Swinh, Ibis, 1863, p. 407.—*Id.*, *ibid.*, 1867, p. 390.—*Id.*, P. Z. S., 1863, p. 312.

1826.—*Trynga glareola* Pall., Zoogr. Ross. As., II, p. 194, pl. lx (*nec* Lin.).

1831.—*Totanus pedestris* Lesson, Tr. d'Orn., p. 552 (*part*).

1844.—*Totanus pulverulentus* Müll., Naturk. Verhandl. (p. 152).—Temm. & Schleg., Faun. Jap. Av., p. 109, pl. 65 (1849).—Middend., Sibir. Reis., II, 2 (p. 214) (1853).—Swinh., Ibis, 1860, pp. 132, 259.—*Id.*, *ibid.*, 1861, p. 343.—*Id.*, *ibid.*, 1862, p. 254.—Radde, Reis. Süd. Ost-Sibir., II (p. 326) (1863).—Whitely, Ibis, 1867, p. 205.—*Actitis p.* Dybow. & Parvex, J. f. Orn., 1868, p. 337.—Taczan., J. f. Orn., 1873, p. 102.—*Id.*, *ibid.*, 1874, p. 336.—*Id.*, Bull. Soc. Zool. France, 1876, p. 250.—*Id.*, *ibid.*, 1882, p. 397.—*Id.*, Orn. Faun. Vost. Sibir., p. 54 (1877).

1848.—*Totanus griseopygius* Gould, P. Z. S., 1848, p. 39.

1871.—*Totanus incanus* Swinh., P. Z. S., 1871, p. 406 (*nec* Gmel.).—*Id.*, Ibis, 1874, p. 163.—*Id.*, *ibid.*, 1875, p 453 —Blakist. & Pryer, Ibis, 1878, p. 220.—*Id.*, *ibid.*, Tr. As. Soc. Jap., VIII, 1880, p. 192.—*Id.*, *ibid.*, X, 1882, p. 109.—Blakist., Amend. List B. Jap., p. 11 (1884).—*Heteroscelus incanus* Bogdan., Consp. Av. Ross., I, p. 98 (1884).

The distinctive characters which separate this species from the foregoing have been pointed out under the head of the latter.

The specimen obtained by me on Bering Island agrees in every particular with specimens from Japan and Halmaheira, while those of *incanus* as closely agree with the examples from America and Polynesia.

The dimensions of the specimen collected are as follows:

♂ ad. U. S. Nat. Mus., No. 89076, *L. Stejneger, No.* 1089; *Bering Island, May* 28, 1882.

Total length, 265^{mm}; wing, 160^{mm}; tail-feathers, 69^{mm}; exposed culmen, 37^{mm}; tarsus, 33^{mm}; middle toe with claw, 30^{mm}.

Remarks.—Iris dark brown. Bill blackish gray, light brownish gray at base of lower mandible. Feet light ocher yellow, joints with a faint greenish tinge.

Only one specimen of this bird was obtained, although I was fully aware of the difference between the two forms, and consequently on the lookout for both.

I afterwards received from Kamtschatka three young birds collected in the fall of 1884. The characters pointed out at once distinguishes them from *incanus*.

Measurements.

U. S. Nat. Mus. No.	Sex and age.	Locality.	Date.	Wing.	Tail.	Culmen.	Tarsus.	Middle toe.
				mm.	*mm.*	*mm.*	*mm.*	*mm.*
101661	jun.	Petropaulski, Kamtschatka	1884	161	67	38	34	30
101662	jun.	......do	1884	164	66	38	32	27
101664	jun.	......do	1884	155	64	37	33	28

54. Numenius phæopus variegatus (Scop.).

1786.—*Tantalus variegatus* Scopoli, Delic. F. Fl. Insubr., II, p. 92 (*ed.* Newt).—*Numenius v.* Seeb., Ibis, 1884, p. 34.—Blakist., Amend. List B. Jap., p. 39 (1884).

1788.—*Scolopax luzoniensis* Gmel., Syst. Nat., I, p. 656.—*Numenius l.* Swinh., P. Z. S., 1871, p. 410.

1817.—*Numenius atricapillus* Vieill., N. Dict. d'Hist. Nat., VIII, p. 303.

1826.—*Numenius phæopus* Pall., Zoogr. Ross. As., II, p. 169 (*part*).—Schleg., Mus. P. B. Grall., p. 93 (*part*).—Swinh., Ibis, 1877, p. 146.—Blakist. & Pryer, Ibis, 1878, p. 223.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 198.—*Iid.*, *ibid.*, X, 1882, p. 116.

1840.—*Numenius uropygialis* Gould, P. Z. S., 1840, p. 175.—Swinh., Ibis, 1863, p. 409.—*Id.*, *ibid.*, 1866, p. 137.—Bogdan., Consp. Av. Ross., I, p. 84 (1884).

1856.—*Numenius tahitiensis* Cassin, Exped. Jap. Perry, II, p. 228 (*nec* Gmel.).—Swinh., P. Z. S., 1863, p. 318.

1883.—*Numenius melanorhynchus* Taczan., Bull. Soc. Zool. France, 1883, p. 340 (*nec* Bp., 1856, qui ex Grœnlandia).

The two specimens which I secured at Bering Island I have carefully compared with specimens of typical *phæopus* from Europe, and with numerous specimens of the eastern representative from China and Japan, and also with a specimen in the National Museum, obtained from Mr. Harting, and determined by him as *N. luzoniensis*. The characters of the dark and strongly streaked rump and the barred under tail-coverts are well developed, and were it not that the occurrence of *numerous* intermediate specimens have been recorded, I should consider the two forms good and distinct species.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Chord of exposed culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92819	2183	Bering Island	June 20, 1883	♀ ad.	439	6	232	95	76	58	40
92820	2190	....do................	June 21, 1883	♀ ad.	......	......	238	99	84	65	41

No. 92819.—Iris dark brown. Bill brownish black, below at base reddish gray. Feet clear bluish gray, joints darker gray. Eggs swollen.

No. 92820.—Colors as foregoing. Eggs large, swollen.

The Eastern Whimbrel is a visitant to the islands during the migrations, in spring and autumn, but, being very wary and their stay short, they are only seldom seen. During the latter part of May, 1882, I observed a flock on the flat sandy borders of the river, behind the village, but the birds disappeared in the fog before I could secure a specimen. During the following spring two females were secured at Emilianovski Mys, on the northern shore, as late as the 20th and 21st of June. They were single, and their eggs large and swollen, so that there is a probability that a few pairs remain during the summer and breed.

In the fall, September 3, 1883, a large flock was observed on the mountain plateau, north of the village, feeding upon the berries of *Empetrum nigrum*. Two young birds were taken on the steamer in the beginning of August, when at sea between Kamtschatka and Bering Island.

55. Phalaropus lobatus (LIN.).

1758.—*Tringa lobata* LIN., Syst. Nat., 10 ed., I, p. 148, cfr. p. 824.—*Phalaropus l.* TURNER, Auk, 1885, p. 157.

1766.—*Tringa hyperborea* LIN., Syst. Nat., 12 ed., I, p. 249.—*Phalaropus h.* DYBOW. & PARVEX, J. f. Orn., 1868, p. 338.—BAIRD, Tr. Chicag. Acad., I, 1869 (p. 706).—TACZAN, Bull. Soc. Zool. France, 1876, p. 251.—*Id.*, Orn Faun. Vost. Sibir., p. 55 (1877).—BLAKIST., Amend. List B. Jap., p. 21 (1884).—*Lobipes h.* DALL & BANNIST., Tr. Chicag. Acad., I., 1869, p. 209.—TACZAN, J. f. Orn., 1873, p. 102.—*Id.*, *ibid.*, 1875, p. 256.—DALL, Avif. Aleut. Isl. West. Unal., p. 5 (1874).—SWINH., Ibis, 1875, p. 455.—COUES in Elliott's Aff. Alaska, p. 180 (1875).—BLAKIST. & PRYER, Ibis, 1878, p. 221.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 196.—*Iid.*, *ibid.*, X, 1882, p. 113.—BEAN, Pr. U. S. Nat. Mus., 1882, p. 165.—ELLIOTT, Monogr. Seal Isl., p. 129, (1882).—NELSON, Cruise Corwin, p. 91 (1883).

1810.—*Phalaropus cinereus* MEY. & WOLF, Taschb. Deutsch. Vögelk., II, p. 417.—MIDDEND., Sibir. Reise, II, 2, p. 215 (1853).—SCHRENCK, Reis. Amurl., I, p. 418 (1860).—FINSCH, Abh. Brem. Ver., III, 1872, p. 65.

1826.—*Phalaropus ruficollis* PALL., Zoogr. Ross. As., II, p. 203.

1826.—*Phalaropus cinerascens* PALL., Zoogr. Ross. As., II, p. 204.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Expos. culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89177	1097	Bering Island............	May 20, 1882	♂ ad.	184	104	52	21	20	21
89178	1098	......do....................	May 29, 1882	♂ ad.	180	103	47	19	20	20
89020	1121	..... do....................	May 30, 1882	♂ ad.	177	101	48	21	21	20
89173	1093	......do....................	May 20, 1882	♀ ad.	......	110	52	20	20	22
89174	1094	......do....................	May 29, 1882	♀ ad.	196	113	53	22	21	20
89175	1095	......do....................	May 29, 1882	♀ ad.	187	109	50	21	21	20
89176	1096	.... do....................	May 29, 1882	♀ ad.	194	106	54	20	20	20
89019	1120	......do....................	May 30, 1882	♀ ad.	187	110	51	......	22	21
92821	1265	......do....................	July 20, 1882	juv.	165	80	35	18	20	20
92822	1266	......do....................	July 17, 1882	pull.	......	....	....	12	19	21

No. 89177.—Iris dark brown. Bill black. Feet grayish blue; joints blackish.

No. 89020.—Iris dark brown. Bill black. Feet grayish blue; outer aspect of tarsus, outer toe, and the joints darker; soles and outer web blackish.

No. 92821.—Iris hazel. Bill blackish. Feet flesh-color; outer aspect and joints dark grayish. A few downy feathers still on the neck.

No. 92822.—Like the foregoing.

The Red-necked Phalarope is one of the commonest breeding summer birds on Bering Island.

In 1882 they arrived in large numbers on the 29th of May, and during the following week all the smaller ponds on the tundras all over the northern part of the island were crowded. In 1883 the new-comers made their appearance five days earlier, as the first ones were shot on May 24.

56. Crymophilus fulicarius (Lin.).

1766.—*Tringa fulicaria* Lin., Syst. Nat., 12 ed., I, p. 249.—*Phalaropus f.* Nelson, Cruise Corwin, p. 91 (1883).—Seeb., Ibis, 1884, p. 33.—Blakist., Amend. List B. Jap., p. 37 (1884).—*Crymophilus f.* Stejneger, Auk, 1885, p. 183.

1788.—*Tringa glacialis* Gmel., Syst. Nat., I, p. 675.

1809.—*Phalaropus rufus* Bechst., Naturg. Deutschl., IV., p. 381.—Pall., Zoogr. Ross. As., II, p. 205 (1826).

1840.—*Phalaropus rufescens*.—Keys. & Blas., Wirbelth. Europ., p. lxxii.—Middend., Sibir. Reis., II, 2 (p. 216) (1853).—Taczan., Bull. Soc. Zool. France, 1876, p. 251.—*Id.*, Orn. Faun. Vost. Sibir., p. 55 (1877).

1880.—*Lobipes wilsonii?* Blakist. & Pryer, Tr. As. Soc. Jap., VIII, 1880, p. 196.—*Iid.*, *ibid.*, X, 1882, p. 113.

When on my boat expedition around Bering Island I observed a flock of Phalaropes, August 21, 1882, several miles at sea. No specimen could be secured, but I do not think I was wrong in my identification.

Order CHENOMORPHÆ.

Superfamily ANATOIDEÆ.

Family ANATIDÆ.

57. Anser segetum middendorffi (Severz.).

1853.—*Anser grandis* Middend., Sibir. Reise., II, 2 (p. 225, tb. xx, fig. 1) (*nec* Gmel.).—Schrenck, Reis. Amurl., I, p. 462 (1860).—Radde, Reis. Süd. Ost-Sibir., II, (p. 354) (1863).—Dybow. & Parvex, J. f. Orn., 1868, p. 338.—Taczan., J. f. Orn., 1873, p. 108.—*Id. ibid.*, 1874, p. 336.—*Id.*, *ibid.*, 1875, p. 256.—*Id.*, Orn. Faun. Vost. Sibir., p. 67 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 42.—*Id.*, *ibid.*, 1883, p. 343.

1873.—*Anser middendorffi* Severzow, Turkest. Jevotn. (pp. 70, 149).—*Id.*, J. f. Orn., 1874, p. 435.—*Id.*, Ibis, 1876, p. 416.

1875.—*Anser segetum* var. *serrirostris* Taczan., J. f. Orn., 1874, p. 333 (*nec* Swinh.).

1875.—*Anser segetum* Swinh., Ibis, 1875, p. 456 (*part*).—Blakist. & Pryer, Ibis, 1878, p. 212 (*part*) —*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 182 (*part*).—*A. segitum. Id.*, *ibid.*, X, 1882, p. 94 (*part*).—Blakist., Chrysanth., 1883, p. 27 (*part*).—(*segetum*) *Id.*, Amend. List B. Jap., p. 8 (*part*).

The state of things in regard to the species of geese of Eastern Asia is in a deplorable condition, and with my scanty material I can hardly expect to solve the question. With all our doubts it is, however, most fortunate that the geese have not suffered the common fate of difficult birds of that region, viz, to be lumped together under one heading. If that had been the case it would have been hopeless to try to unravel the confusion. This confusion goes even so far that Taczanowski, who, in 1877, enumerates as No. 372 *Anser grandis* Pall., and as No. 371 *Anser grandis* Midd., *nec* Pall. (!), still in 1883 speaks of *Anser grandis* Midd., a form which already, ten years before, was called *Anser middendorffi* by his countryman, Severzow.

As already stated, my material is rather scanty, consisting of the following specimens: Four birds from Europe, referable to *A. segetum* and to *A. segetum arvensis*. Three birds from Bering Island, which certainly belong to *A. middendorffi* (=*grandis* Midd.), as will be shown below. One specimen from Shanghai, which I take to be a typical *A. segetum serrirostris* for reasons to be discussed further on.

It is at first sight evident that these birds belong to two groups, one with rather slender bills, to which all the European specimens are referable,* the other with much heavier bills ("huge bills," as Swinhoe says), to which all the eastern birds belong. In coloration I can detect no difference, except that the eastern specimens have the heads perceptibly more brownish, a feature which, according to Schrenck's statement, is not constant. This brown wash seems to me to be due to a similar cause to that which colors the heads of the swans more or less rusty. This is especially striking in specimens which still have the white semilunar spots on the feathers bordering the bill, in which these white spots are tinged exactly in the same manner as in the swans. A white-fronted goose before me presents the same feature. If in the swans the rusty color is due to external staining, then the same is the case with the brown color of the heads of the eastern geese. As the rest of the plumage is essentially the same both in the western and the eastern birds, the whole question as to their distinctness becomes a question of size.

Before proceeding further a comparative table of dimensions may not be out of place.

U. S. Nat Mus. No.	Collector's No.	Collector's name.	Locality.	When collected.	Sex and age.	Total length. mm.
92824	2022	L. Stejneger	Bering Island	May 10, 1883	♂ ad.	850
92825	2023	do	do	May 10, 1883	♀ ad.	772
101207	114	N. Grebnitski	do	May 22, 1884	(♀) ad.	......
85758	58	L. P. Jouy	Shanghai	Dec. 27, 1880	♀ ad.	(711)
34099	.....	Mus. Stockholm	"Suecia" (63c)	July 21, 1859	♂ ad.	......
57160	......	Schlüter	Germany	....	♀? ad.	......
57161	.....	do	do	....	♀ ad.	.....
57162	......	do	do	....	♂? ad.	......

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* I am not prepared to pass any opinion at present upon the two alleged European races. So much is certain from my material at hand, that the number of lamellæ does not correspond with the greater or less development of the yellow color on the bill. An old male with a very narrow and well-defined yellow ring behind the nail, even narrower than on Naumann's pl. 287, vol. xi, has not less than twenty-six lamellæ. As my specimens agree mutually in all characters in which they are separate from the eastern ones, it suffices here to handle them as one group.

U. S. Nat. Mus. No.	Wings beyond tail.	Wing.	Tail-feathers.	Expos. culmen.	Bill along gape.	Bill to hind border of nostrils.	Nail of bill.	Height of bill behind nail.	Height of bill at base.	Breadth of bill at middle of nostrils.	Tarsus.	Middle toe with claw.	Number of lamellæ.
	mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92824	10	495	143	75	72	53	19	18	40	25	96	93	20
92825	25	463	134	68	66	48	18	......	37	24	86	82	20
101207	......	435	122	63	67	47	18	16	35	24	85	81	23
85758	......	500	145	60	64	45	16	......	36	25	82	82	20
34099	......	(*)	135	63	63	42	15	11	32	21	85	84	24
57160	......	470	134	61	62	40	16	13	30	20	......	80	23
57161	......	445	128	60	63	42	17	13	30	20	......	74	24
57162	......	440	121	60	62	40	16	13	30	20	......	......	26

* Moulting.

The difference in the dimensions of the bills of the two groups is so striking that no further comment is necessary. It will, however, be seen that the eastern birds show quite a considerable difference too in the bill, as the latter in the Chinese bird is not longer than in the European forms, while its height and breadth are almost identical with the corresponding dimensions of my Bering Island birds. There is also another difference. If the measurement of the total length (28 inches) given on the label is reliable, the Shanghai bird is a considerably smaller bird, having, however, both wings and tail longer than even the male bird from Bering Island. In the coloration I can see no tangible difference.

I will not deny even the probability of these differences being only individual variation within the same species, but I do not feel justified in uniting them under the same name, as long as there exists a possibility of their being distinct. Should this be proven, I would be rightly blamed if adding to the present confusion by unnecessarily lumping them together. This course is the safer one also for the reason that most writers on the birds of Eastern Asia recognize two or more forms of *A. segetum.*

The next question is, what names shall be applied to the two forms. In the first place it may now be regarded as a well established fact that Gmelin's and Pallas's *grandis*, which has the bill nearly 4 inches long, is a bird quite different from either of the two forms here discussed. That Middendorff's *grandis*, however, is identical with the specimens from Bering Island can hardly be doubted, so well do their measurements agree with those given as taken from typical Amur specimens.[*] They will therefore have to stand as *A. segetum middendorffi.*

The Chinese specimen is probably entitled to the name *A. segetum serrirostris*[†] on account of its locality. It is difficult to make anything out of Swinhoe's description. He says (P. Z. S., 1871, p. 417): "They are of large size, and peculiar in having huge bills approximating that of *A. grandis.* I have handled several, and they were all so distinguishable." The "*A. grandis*" with which Swinhoe was acquainted was only Middendorff's "*grandis*" (cf. P. Z. S., 1863, p. 323), as the true *grandis* of Pallas and Gmelin at that time had not yet been rediscovered. If the "hugeness" of the bill in his specimen only approximated that of *grandis*, it must have been somewhat similar to that of the Shanghai bird in the National Museum.

Not knowing of the occurrence in Eastern Asia of a slender-billed form like the typical *A. segetum*, I have referred all instances of the latter name to *serrirostris*, where it has been used in opposition to *A. middendorffi.*

It seems as if both forms occur in Japan. In the different lists of the birds of Japan, published by Blakiston and Pryer, we find repeatedly: "There seem to be two forms, a large and a small, possibly separable." Captain Blakiston has most liberally placed his manuscript notes in my hands for a critical review, but as only measurements of the bills of a few specimens are given I can throw very little light on the present question. The measurements given all belong to *A. middendorffi* (80^{mm} and 3¼ to 2⅞ inches = 77 to 70^{mm}).

Finally, I give the detailed description of my two birds as they were taken down from the fresh specimens less than an hour after their death:

♂ ad., U. S. Nat. Mus. No. 92824, L. Stejneger No. 2022; Ladiginsk, Bering Island, May 10, 1883.

Tip of middle toe (without claw) reaches 72^{mm} beyond tip of tail, legs being stretched backwards. Weight 10 pounds.* Iris dark brown. Bill brownish black, with a clear yellow band across the bill.

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[*] The measurements given by Severzow of the bill of males from the Amur (Ibis, 1876, p. 417), 1″ 9‴ – 2″ ' may probably rest on a mistake or a misprint. Schrenck gives commissure 3 inches (= 76^{mm}), and culmen 2″ 9‴ – 2″ 10‴ (= $70–72^{\text{mm}}$).

[†] The following is a partial synonymy of this form:

Anser segetum serrirostris SWINH.

1853.—***Anser segetum*** MIDDEND., Sibir. Reise, II (p. 225).—SWINH., Ibis, 1860, p. 67.—*Id.*, *ibid.*, 1861, p. 344.—*Id.*, *ibid.*, 1862, p. 253.—*Id.*, *ibid.*, 1867, p. 392.—*Id.*, *ibid.*, 1875, p. 456 (*part*).—*Id.*, P. Z. S., 1863, p. 323.—SCHRENCK, Reis. Amurl., I, p. 462 (1860).—RADDE, Reis. Süd. Ost-Sibir., II (p. 356) (1863).—DYBOW. & PARVEX. J. f. Orn., 1868, p. 338.—BLAKIST & PRYER, Ibis, 1878, p. 212 (*part*)?.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 182 (*part*)?.—(*A. segitum*) *Iid.*, *ibid.*, X, 1882, p. 94 (*part*)?.—BLAKIST., Chrysanth., 1883, p. 27 (*part*)?.—(*segetum*) *Id.*, Amend. List B. Jap., p. 8 (*part*)?.

1871.—***Anser segetum*** var. ***serrirostris*** SWINH., P. Z. S., 1871, p. 417.—TACZAN., J. f. Orn., 1873, p. 108.—*Id.*, Orn. Faun. Vost. Sibir., p. 67 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 42.

Not long after the drawing (pl. vii, fig. 1) was made the color changed to a brownish orange, paler and more approaching flesh-color anteriorly. Feet orange, with more yellowish webs, and black nails. Rather lean.

No trace of white on feathering bordering the bill.

♀ *ad.*, *U. S. Nat. Mus. No.* 92825, *L. Stejneger*, *No.* 2023; *Ladiginsk*, *Bering Island*, *May* 10, 1883.

Middle toe reaches 68^{mm} beyond the tail. Weight 8¾ pounds. Iris dark brown. Color of bill very much as in the specimen above, the yellow, however, being of a paler shade, and not extended behind the nostrils. Feet as in the foregoing. Rather fat. Eggs swollen, the largest one having a diameter of 15^{mm}.

Feathering along the base of bill with faint traces of white semilunes, these, however, being strongly tinged with rusty.

Grebnitski's specimen (No. 101207) is very much like the latter, but there are faint yellowish mottlings along the lower border of the nostrils, and no trace of white on the feathers encircling the bill.

This goose, which is said to be very common in many parts of Kamtschatka, is not of regular occurrence on Bering Island even during the migrations. The appearance of a small flock in May, 1883, out of which the present pair were shot, was due to the same cause which brought so many Kamtschatkan species over to the islands. From Governor Grebnitski I afterwards received a specimen shot on Bering Island May 22, 1884.

58. Anser albifrons gambeli (Hartl.).

1827.—*Anas albifrons* Bonap., Specchio Comp., p. 70.—*Anser a.* Swinh., Ibis, 1875, p. 456.—*Id.*, *Ibid.*, 1877, p. 146.—Blakist. & Pryer, Ibis, 1878, p. 212.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 182.—*Iid.*, *ibid.*, X, 1882, p. 95.—Blakist., Amend. List B. Jap., p. 8 (1884).

1852.—*Anser gambeli* Hartl., Rev. and Mag. Zool., 1852, p. 7.—Dall & Bannist., Tr. Chicag. Acad., I, 1869, p. 294.—Dall, Avif. Aleut. Isl. Unal. eastw., p. 5 (1873).—*Id.*, Avif. Aleut. Isl. west Unal., p. 6 (1874).

1852.—*Anser erythropus* Baird, Stansbury's Rep., 1852 (p. 321) (*nec* Lin.).—Schleg., Mus. P. B. Anser., p. 110 (1867).

1872.—*Anser albifrons* var. *gambeli* Coues, Key, 1 ed., p. 282.—Nelson, Cruise Corwin, p. 93 (1883).—Turner, Auk, 1885, p. 158.

1875.—*Anser brachyrhynchus* Swinh., Ibis, 1875, p. 456 (*nec* Baill.).—Blakist. & Pryer, Ibis, 1878, p. 212.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 182.—*Iid.*, *ibid.*, X, 1882, p. 95.—Seeb., Ibis, 1883, p. 369.—Blakist., Chrysanth., 1883, p. 27.—*Id.*, Amend. List B. Jap., p. 33 (1884).

Schlegel has already pointed out that the Japanese white-fronted geese belong to the large American form which, by Hartlaub, has been called *gambeli*, and Nelson gives it as occurring on the Siberian coast of Bering Sea. The specimen obtained by me on Bering Island confirms these statements, since it certainly belongs to the typical *A gambeli*, as will be seen from the measurements given below; it matches average North American specimens in every particular.

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* Cfr. Severzow (*l. c.*), "10–10½ lb."

On the average the American birds are larger and their bills bigger than true *A. albifrons*, although the difference is much less than between the latter and *erythropus*. In the United States National Museum, however, there is a specimen said to be from Abydos, which is fully as large as the average American birds. The locality is not undoubted, however, and the specimen may have come from America. On the other hand, a winter specimen from Texas is not larger than typical *albifrons*, but is probably a migrant from Greenland, where this form breeds and where *A. gambeli* is not known to occur.

At all events, the measurements which I have taken have convinced me that *gambeli* is only a race or subspecies of *albifrons*, while the latter may be regarded as specifically distinct from *erythropus*.

The specimen from Bering Island measures:

♀ *ad., U. S. Nat Mus. No.* 92826, *L. Stejneger No.* 2021; *Kamennij valley, Bering Island, May* 10, 1883.

Total length 685mm. Closed wings beyond tail 20mm. Middle toe (without claw) reaches tip of tail, legs being stretched backwards. Wing 417mm. Tail-feathers, 124mm. Bill, from tip to frontal feathering, 51mm; along gape to angle of mouth 52mm; to posterior angle of nostrils 37mm. Breadth of bill at middle of nostrils 18mm; height at base 29mm. Tarsus 78mm. Middle toe with claw 76mm.

The following notes were taken down immediately after the bird was shot and a colored drawing (pl. vii, fig. 2) made:

Weight 6¾ pounds. Iris very dark brown. Bill, milky white; the anterior part and tomia with a very faint rosy tinge; the posterior parts with a hardly perceptible wash of bluish; a square figure on culmen, edges of nostrils, a small spot beneath them, and the basal two-thirds of the lower half of the under mandible, cadmium yellow; naked skin on mental angle and corner of mouth of the same color, but paler; a stripe along the forehead pale brownish yellow; nail cream colored; naked eye-ring, dark brownish gray. Feet vivid cadmium yellow; webs somewhat paler and purer yellow; nails horny white. Fat.

The colors changed about an hour after the colored drawing was finished, the white becoming flesh-color.

This specimen was shot on the same day on Bering Island as the pair of the foregoing species, but in a different part of the island. At least three were seen. It seems to occur regularly during the spring migration, and has already been mentioned by Steller from Bering Island. In 1882 I had the opportunity of examining two specimens shot on Lake Saranna, Bering Island, in April. They were prepared by Mr. Grebnitski, who had them forwarded to St. Petersburg. The culmen of the male measured 51mm.

59. Branta canadensis hutchinsii (RICH.).

1826.—*Anser canadensis* PALL., Zoogr. Ross. As., II, p. 230.

1831.—*Anser hutchinsii* RICHARDS. in Sw. & Rich. Faun. Bor. Amer., II, 470.—*Bernicla h.* DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 295.—FINSCH, Abh. Ver. Brem. III, 1872, p. 20.—SEEB., Ibis, 1882, p. 369.—BLAKIST. & PRYER, Tr. As. Soc. Jap., X, 1882, p. 96.—BLAKIST., Amend. List B. Jap., pp. 9, 33 (1884).

1836.—*Anser leucoparcius* BRANDT, Bull. Sc. Acad. St. Petersb., I, 1836, p. 37.—*A.* (*Bernicla*) *l. Id.*, Descr. and Icon. Anim. Ross. Nov. Aves, I, p. 13.—*Bernicla l.* BLAKIST. & PRYER, Ibis, 1878, p. 212 —*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 183.—*Branta l.* STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 70.

1872.—*Branta canadensis* var. *hutchinsii* COUES, Key N. Am. B., p. 284.—TURNER, Auk, 1885, p. 158.

A comparison of undoubted specimens of the true *hutchinsii* with skins from the Aleutian Islands and Brandt's original description, containing the dimensions of *leucopareius*, convinces me that these two names are absolute synonyms, being different, however, from what has usually been called *leucopareia* by American writers. In 1858 Baird (Hist. N. Amer. B., p. 765) headed a species *leucopareia* to which he gave the name *occidentalis* in the text, suspecting it to be different from Brandt's bird, as it really was. Afterwards the name *leucopareia* was applied by Dr. Coues to a small short-billed race, specimens of which were obtained at the Prybiloff Islands, and herein American authors have afterwards followed him when speaking of the same form as occurring in Alaska, or, during the migrations, in more southern localities along the western coast. This race, which probably is a northern and northwestern form of *occidentalis*, in the same manner as *hutchinsii* seems to be a northern and northwestern form of the true *canadensis* has been called *Branta minima* by Robert Ridgway. Both this and *hutchinsii* (=*leucopareia*) inhabit Alaska, and hence the confusion.

Several marks have been given as distinctive of the two small forms, *hutchinsii* and *minima*, *e. g.*, the absence or presence of a white ring round the lower part of the neck, the absence or presence of a black "bridge" separating the two white cheek-patches, &c., but none of these characters hold good through an extensive series. The really distinctive marks seem to be the relative length of the bill, it being longer in *hutchinsii*, besides the lighter surface of the latter form, the color of the breast fading gradually into the white of the belly, while in *minima* the limit is abrupt and well marked. Both forms have sixteen tail-feathers, and are about of the same size.

Captain Blakiston was correct in identifying the birds from Japan as *leucopareia*, and so was Mr. Seebohm when he afterwards referred them to the true *hutchinsii*, but he is entirely wrong when saying (Ibis, 1882, p. 369): "A skin sent (No. 2621) proves to be of this species (*hutchinsii*), and not of *B. leucopareia*. The former has sixteen tail-feathers, with the wing 16 inches long, whilst the latter is said to have eighteen tail-feathers, with the wing 18 inches long." He evidently confounds *leucopareia* with *B. occidentalis* BAIRD, which, like *canadensis*, is said to have eighteen to twenty rectrices,(?) and the wing measuring from 16.25 to 18 inches, while *leucopareia* (= *hutchinsii*) has only sixteen tail-feathers, and the wing from 13.60 to 16.35 inches long. I find in Captain Blakiston's manuscript notes measurement of birds from the Kuriles agreeing closely with those of true *hutchinsii*. Mr. Seebohm has apparently been led to make the above statement by not being aware that Baird's *leucopareia* (B. N. A., p. 765) is the same author's *occidentalis*, which is different from Brandt's *leucopareia*.

List of specimens collected.

U. S. Nat Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total-length.	Wing beyond tail.	Wing.	Tail-feathers.	Bill from frontal feathers.	Bill along gape.	Bill to hind border of nostrils	Breadth of bill at nostrils.
					mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
89109	1259	Bering Island	July 11, 1882	......	......	......	....	.....	34	40	27	18
92827	2165	...do	June 9, 1883.	♂ ad..	657	0	390	108	32	37	24	17

No. 80109.—Head only.

No. 92827.—Bill and feet black. Testes small, hardly 10^{mm} long. Rather lean. Weight 4¾ pounds. Number of rectrices 15.

Hutchinson's white-cheeked goose is probably the only one of the *Leucoblepharon* group which breeds in the Palæarctic ornis. As already announced in my preliminary report (Pr. U. S. Nat. Mus., 1883, p. 70), I found it breeding in small numbers on Bering Island, where I observed them repeatedly on the large swamp east of the village, and where afterwards an adult was shot and one of the six downy young captured. My hope that the latter might escape being eaten by any of the six hundred dogs of the village was not fulfilled.

In 1883 the first arrivals were announced on the 2d of May, and on the 9th of June a male was killed near Saraunа.

This species has also been found breeding on the Kurile Islands, and seems to pass the winter in Japan. It is nowhere common in the Old World, where it probably is only an immigrant of comparatively late date.

60. Branta nigricans (LAWR.).

1826.—*Anser brenta* PALL., Zoogr. Ross. As., II, p. 229 (*part*).

1846.—*Anser nigricans* LAWRENCE, Ann. Lyc. N. Y., IV, 1846, p. 171.—*Bernicla n.* DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 295.—DALL, Avif. Aleut. Isl. west Unal., p. 6 (1874).—BEAN, Pr. U. S. Nat. Mus., 1882, p. 166.—NELSON, Cruise Corwin, p. 94 (1883).—BLAKIST., Amend. List B. Jap., p. 33, (1884).

1858.—*Anas bernicla* KITTL., Denkw., II, p. 384 (*nec* LIN.).

1878.—*Bernicla torquata* BLAKIST. & PRYER, Ibis 1878, p. 212 (*nec* VIEILL.)—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 183.—*Iid.*, *ibid.*, x. 1882, p. 96.

1882.—*Bernicla brenta nigricans* COUES, Check-list, 2 ed., p. 112.—SEEB., Ibis, 1884, p. 32.

The Black Brant has already in "The Ibis" for January of last year been shown to occur in the eastern part of the Palæarctic region, as it winters in Northern Japan.

On the islands visited by me it only occurs during the migrations, and even then very sparingly. A young female, the only specimen caught during my stay, was obtained late in fall, when swimming at sea, a little off the northern shore. It kept company with some individuals of *Phalocrocorax pelagicus*, no others of its own kind being seen in the neighborhood. The œsophagus contained green algæ and leaves of a *Zostera*. It was very fat. The measurements are as follows:

♀ *jun.*, *U. S. Nat. Mus. No.* 92828, *Stejneger*, *No.* 1712; *Severnij*, *Bering Island*, *November* 8, 1882.

Total length 568$^{\mathrm{mm}}$. Tail beyond wings 15$^{\mathrm{mm}}$. Wing 330$^{\mathrm{mm}}$. Tail-feathers 88$^{\mathrm{mm}}$. Bill along gape 36$^{\mathrm{mm}}$. Tarsus 64$^{\mathrm{mm}}$. Middle toe, with claw 55$^{\mathrm{mm}}$. Weight 5 pounds. Iris dark brown.

61. Olor cygnus (LIN.).

1758. *Anas cygnus* LIN., Syst. Nat., 10 ed., I, p. 122 (*part*).

1779. *Anas olor* PALL., Sv. Vet. Acad. Handl., XL, p. 27 (*nec* GMEL., 1788).—*Cygnus o. Id.*, Zoogr. Ross. As., II, p. 211 (*part*) (1826).

1809.—*Cygnus musicus* BECHST., Gemein. Naturg. Deutschl., IV, p. 830.—MIDDEND., Sibir. Reise, II, 2 (p. 224) (1853).—SCHRENCK, Reis. Amurl., I, p. 455 (1860).—SWINH., Ibis, 1862, p. 254.—*Id.*, *ibid.*, 1875, p. 456.—*Id.*, P. Z. S., 1863, p. 323.—*Id.*, *ibid.*, 1871, p. 416.—BLAKIST., Ibis, 1862, p. 332.—*Id.*, Chrysanth., 1883, p. 26.—*Id.*, Amend. List B. Jap., p. 23 (1884).—RADDE, Reis. Süd. Ost-Sibir., II (p. 348) (1863).—DYBOW. & PARVEX., J. f. Orn., 1868, p. 338.—PRZEW., Putesch. Ussur. (n. 189) (1870).—TACZAN., J. f. Orn., 1873, p. 108.—*Id.*, *ibid.*, 1874, p. 336.—*Id.*, Bull. Soc. Zool. France, 1877, p. 44.—*Id.*, *ibid.*, 1883, p. 343.—*Id.*, Orn. Faun. Vost. Sibir., p. 68 (1877).—BLAKIST. & PRYER, Ibis, 1878, p. 211.—*Iid.*, Tr. As. Soc. Jap. VIII, 1880, p. 182.—*Iid.*, *ibid.*, X, 1882, p. 94,

No specimens of this swan were procured, but I identified several heads in Petropaulski as belonging to the Hooper, which, in fact, is the common species of this region. During the winter 1882–'83, swans were repeatedly observed on Bering Island, but as they were extremely shy none were obtained, nor was it even possible to get so near to them as to be able to identify the species with absolute certainty. I have little doubt, however, that they belonged to the species in question, and not to the following.

The first ones were observed on October 15, 1882, when a flock of six individuals was seen flying over the village, Bering Island, from west to east. Two seem to have passed the winter at Severnij, where they were observed on January 10 and March 18, 1883. Another was reported from Zapadnij, April 24, 1883.

62. Olor columbianus (ORD).

1815.—*Anas columbianus* ORD in Guthrie's Geogr. 2d Amer. ed. (p. 319).—*Olor c.* TURNER, Auk, 1885, p. 157.

1831.—*Cygnus americanus* SHARPLESS in Doughty's Cab. Nat. Hist., I, No. 8, p. 185.—DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 293.—DALL, Avif. Aleut. Isl., west Unal., p. 6 (1874).—*Olor a.* NELSON, Cruise Corwin, p. 92 (1883).

On November 3, 1882, one of the natives of Bering Island brought me a young swan, shot at Fedoskija, which puzzled me not a little.

According to all information, the two species of swans of Eastern Asia should be *Olor cygnus* and *Olor bewickii*, and the specimen, therefore, ought to belong to one of them. The young of these species have been considered difficult to distinguish, but in my "Monograph of the Cygninæ" (Pr. U. S. Nat. Mus., Stat. 1882, p. 174 seqv.) I had pointed out a character, which I was now going to try. A close examination showed me that my specimen, a young male, in its gray plumage, was just a little larger than the largest *O. bewickii* ever measured by me (more than twenty), being much smaller, however, than young *O. cygnus* (= *musicus*) of the same age. But, while agreeing better with *bewickii* as to size, the bill was essentially that of *O. cygnus*, not high at the base, with nearly perpendicular *processus maxillaris* of the nasal bone, as in the former, but rather depressed and with the said *processus* decidedly oblique, as in the latter. In addition to these features the bird was remarkable for having the feet colored white; not light gray, but decidedly white. I at first fancied it to be a smaller eastern representative of *O. cygnus*, but heads of adults of the latter from Kamtschatka convinced me that eastern specimens of the Hooper are as typical as those from Europe.

The measurements agreed, however, still better with those of *Olor columbinaus* (= *americanus*), and a careful comparison with specimens of the latter in the National Museum renders it absolutely certain that the bird shot on Bering Island belongs to this American species. This is the first record of the Whistling Swan having been obtained in Asia.

The young American Whistling Swan agrees with *O. cygnus* in having the bill depressed at base and the *processus maxillaris* of the nasal bone much oblique, thus being easily distinguished from *Olor bewickii*. It is, however, much smaller than *O. cygnus*, and the outline of the culmen is different, being slightly concave in the latter, while straight or rather convex in *O. columbianus*.

My specimen is a perfect counterpart of examples from various parts of America in the National Musuem, being only a trifle lighter and with whitish feet. In the latter respect it seems to agree with No. 81230 from Alaska, which in all probability had the feet equally light when alive. In all other respects the Bering Island bird matches No. 85579 (cfr. description and measurements in my Monograph, *tom. cit.*, p. 212). A comparison of the measurement of the two specimens will be appended below.

The following notes on the color of the naked parts were written down immediately after receiving the bird: Iris dark brown. Bill and lores whitish flesh-color, tinged with reddish in front of the nostrils, with bluish behind those, and with yellowish at the base, and on the naked eye-ring; terminal half of the portion between nostrils and tip, including the nail, as also the borders of the nostrils and tomia, blackish; naked skin of mental angle flesh-color. Feet white, with a faint bluish tinge, and with a yellowish wash on the lower part of tarsus in front, and on the sides of the toes; webs, under surface of feet, and upper portion of tarsus mottled with dark gray; claws horny white, black towards the tips.

Table of dimensions.

[Taken from the fresh specimens.]

Olor columbianus.	U. S. Nat. Mus. No. 85579. Currituck, North Carolina, November 28, 1881, jun.	U. S. Nat. Mus. No. 92823; Stejneger No. 1709. Bering Island, November 3, 1882, ♂ jun.
	mm.	*mm.*
Total length	1183	1165
Tip of tail beyond closed wings	63	40
Length of bill along gape	84	88
Length from tip to the front of the nostrils	39	45
Length to the fore border of the eye	108	113
Breadth of bill at the middle of the nostrils	31	29
Length of toes with claws:		
Outer toe	130	126
Middle toe	138	128
Inner toe	107	112
Hind toe	26	26
Length of tarsus	110	112
Length of wing	510	550
Length of longest tail-feathers	187	134
Stretch of wings	....	2060

The weight of the Bering Island specimen was 12½ pounds.

It was most likely an accidental straggler, as, in all probability, the other swans observed during the winter belonged to the species common in the region, *O. cygnus.*

63. Anas boschas Lin.

1758.—*Anas boschas* Lin., Syst. Nat., 10 ed., I, p. 127.—Pall., Zoogr. Ross. As., II, p. 225 (1826).—Middend., Sibir. Reise, II, 2 (p. 229) (1853).—Kittl., Denkw., II, p. 294 (1858).—Schrenck, Reis. Amurl. I, p. 472 (1860).—Swinh., Ibis, 1861, p. 344.—*Id.*, *ibid.*, 1862, p. 254.—*Id.*, *ibid.*, 1877, p. 146.—*Id.*, P. Z. S., 1863, p. 324.—*Id.*, *ibid.*, 1871, p. 417.—Blakist., Ibis, 1882, p. 332.—*Id.*, Chrysanth., 1883, p. 27.—Radde, Reis. Süd. Ost-Sibir. II, (p. 363) (1863.)—Dybow. & Parvex, J. f. Orn., 1868, p. 338.—Dall & Bannist., Tr. Chicag. Acad., I, 1869, p. 296.—Przew., Putesch. Ussur. (n. 197) (1870).—Dall. Avif. Aleut. Isl. Unal. eastw., p. 5 (1873).—Taczan., J. f. Orn. 1873, p. 109.—*Id.*, *ibid.*, 1874, p. 336.—*Id.*, Orn. Faun. Vost. Sibir., p. 69 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 45.—*Id.*, *ibid.*, 1883, p. 343.—Blakist. & Pryer, Ibis, 1878, p. 213.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 183.—*Iid.*, *ibid.*, X. 1882, p. 96.—Seeb., Ibis, 1879, p. 22.—Hartlaub, J. f. Orn., 1883, p. 281.—Nelson, Cruise Corwin, p. 95 (1883).—Turner, Auk, 1885, p. 158.

The Wild Duck is known by the natives as "*Selesenn*," being very numerous on Bering Island, and the only member of the group *Anatinæ* wintering there, although in limited numbers.

On Copper Island it is only met with during the migrations, as there are few or no localities suitable for it to breed.

In Kamtschatka it is, of course, of common occurrence.

List of specimens.

U. S. Nat. Mus. No.	Collector's No.	Locality.	Date.	Sex and age.	Wing.	Tail-feathers.	Expos. culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm*	*mm.*
89117	1045	Bering Island	May 13, 1882	♂ ad.	283	92	55	46	61
101210	G. 21	.....do	April—, 1884	(♂) ad.	280	95	55	44	57

Remarks.—Iris dark brown. Bill olive; nail black. Feet light salmon red; webs blackish towards the middle.

Eggs were taken during the first part of June and measure as follows:

U. S. Nat. Mus. No. 21795, *Stejn.* No. 1172, Toporkoff Island, June 6, 1882; belonging to a clutch of nine; 60 by 41.5^{mm}; 59 by 42.5^{mm}.

Mus. No. 21781, S. No. 2194, Kamennij Vall., Bering Island, June 19, 1883; set complete: 56.5 by 44^{mm}; 56.5 by 44^{mm}; 56.25 by 42.5^{mm}; 55 by 43^{mm}; 56 by 42^{mm}; 56 by 42.5^{mm}; 56 by 42.5^{mm}.

64. Dafila acuta (Lin.).

1758.—*Anas acuta* Lin., Syst. Nat., 10 ed., I, p. 126.—Nordmann in Erman's Verz. Th. Pfl., p. 18 (1835).—Temm. & Schleg., Faun. Jap. Av. (p. 128).—Middend., Sibir. Reis., II, 2 (p. 233) (1853).—Kittl., Denkw., II, p. 292 (1858).—Schrenck, Reis. Amurl., I, p. 481 (1860).—Radde, Reis. Süd. Ost-Sibir. II (p. 371) (1863).—Swinh., P. Z. S., 1863, p. 324.—Przew., Putesch. Ussur. (n. 204) (1870).—Finsch, Abh. Brem. Ver., III, 1872, p. 66.—*Dafila a.* Cassin, Exp. Jap. Perry, II, p. 231 (1857).—Swinh., Ibis, 1861, p. 345.—*Id.*, *ibid.*, 1867, p. 399.—*Id.*, *ibid.*, 1877, p. 147.—*Id.*, P. Z. S., 1871, p. 413.—Blakist., Ibis, 1862, p. 332.—*Id.*, Amend. List B. Jap., p. 9 (1881).—Whitely, Ibis, 1867, p. 207.—Dall & Bannist., Tr. Chicag. Acad., I, 1869, p. 297.—Taczan., J. f. Orn., 1873, p. 109.—*Id.*, *ibid.*, 1874, p. 337.—*Id.*, Orn. Faun. Vost. Sibir., p. 69 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 45.—*Id.*, *ibid.*, 1883, p. 343.—Blakist. & Pryer, Ibis, 1878, p. 213.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 184.—*Iid.*, *ibid.*, X, 1882, p. 97.—Seeb., Ibis, 1879, p. 22.—Nelson, Cruise Corwin, p. 96 (1883).

1816.—*Anas caudacuta* Leach, Syst. Cat. M. B. Brit. Mus., p. 38.—Pall., Zoogr. Ross. As., II, p. 280 (1826).

The Pintail (Russ. "*Vostrochvost*") arrives at Bering Island during the latter part of April. In 1883 I observed the first ones, while on a sledge trip to the southern end of the island, between Comandore and Polovino, on the 23d of April. Four days later they were seen in the neighborhood of the village. From this time on they were found everywhere in suitable places, as this species is undoubtedly the most numerous among the fresh-water ducks on the island. Still, on the 20th of May I found them in flocks, but soon the pairs dispersed over the tundras and the swamps of the valleys, and already the 4th of June a nest with seven eggs was secured on Toporkoff Island; six days after, another nest with five eggs was taken.

I have no sure record of its having been found breeding in Copper Island, where, in fact, localities suitable for fresh-water ducks are rather scarce. But I have little doubt that a few pairs breed in Pestschanij or in Gladkovskij.

The eggs measure as follows:

U. S. Nat. Mus. No.	Stejneger No.	Diameters.	Date.	Locality.	Remarks.
		mm.			
21784	2143	50 by 37	June 9, 1883	Bering Island	Whole clutch.
		50.5 by 36			
		50 by 36.5			
		50 by 37			
		50 by 36.5			
21796	1162	53 by 39	June 6, 1882	......do	Clutch contained nine eggs.
		56 by 39			
		53 by 38.5			
		54.5 by 39			
		53.5 by 38			
		54 by 39			
		53 by 38			
21797	1114	54 by 38	May 29, 1882	......do	
		53 by 38			

List of specimens.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Expos. culmen.
					mm.	*mm.*	*mm.*	*mm.*
92832	1397	Bering Island	Aug. 3, 1882	♀ juv.	508	*200	90	44
89105	1400	.... do	Aug. 5, 1882	♂ juv.	505	*165	87	42
101208	G. 121	......do	June —, 1884	(♂) ad.	.....	263	167	52
101209	G. 95	..... do	May 20, 1884	(♂) ad.	......	254	109	50

* Primaries not yet fully out.

No. 92832.—Iris dark brown. Bill bluish gray, blackish towards tip. Feet brownish gray, lighter and somewhat yellowish on the front of tarsus and toes.

No. 89105.—Iris blackish brown. Feet brownish gray, with a greenish tinge, and more yellowish on front of tarsus and toes.

65. Nettion crecca (LIN.).

1758.—*Anas crecca* LIN., Syst. Nat., 10 ed. I, p. 126.—PALL. Zoogr. Ross. As., II, p. 263, (1826).—TEMM. & SCHLEG. Faun., Japan, Av. (p. 127) (1849).—MIDDEND , Sibir. Reis., II. 2 (p. 230) (1853).—KITTL., Denkw., II, p. 292 (1858).—SCHRENCK, Reis. Amurl., II, p. 474 (1860).—RADDE, Reis. Süd. Ost-Sibir., II (p. 367) (1863).—SWINH., P. Z. S., 1863, p. 324.—DYBOW. & PARVEX, J. f. Orn., 1868, p. 338.—PRZEW., Put. Ussur. (n. 205).—BLAKIST., Ibis, 1876, p. 335.—*Querquedula c.* SWINH., Ibis, 1861, p. 345.—*Id.*, *ibid.*, 1865, p. 347.—*Id.*, *ibid.*, 1867, p. 399.—*Id.*, *ibid.*, 1870, p. 366.—*Id.*, *ibid.*, 1877, p. 147.—WHITELY, Ibis, 1867, p. 207.—TACZAN., J. f. Orn., 1873, p. 110.—*Id.*, *ibid.*, 1874, p. 337.—*Id.*, Orn. Faun. Vost. Sibir., p. 70 (1877.)—*Id.*, Bull. Soc. Zool. France, 1877, p. 46.—*Id.*, *ibid.*, 1883, p. 343.—BLAKIST. & PRYER, Ibis, 1878, p. 213.—*Iid.*, Tr. As. Soc. Jap. VIII, 1880, p. 184.—*Iid.*, *ibid.*, X, 1882, p. 97.—SEEB., Ibis, 1879, p. 22.—BLAKIST., Chrysanth., 1883, p. 27.—*Id.*, Amend. List B. Jap., p. 9 (1884).—*Nettion c.* BLAKIST., Ibis, 1862, p. 332.

List of specimens.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Expos. culmen.
					mm.	*mm.*	*mm.*	*mm.*
89106	1038	Bering Island	May 11, 1882	♂ ad.	368	183	66	35
89107	1049	......do	May 14, 1882	♀ ad.	338	168	61	33
89108	1409	.....do	Aug. 5, 1882	♂ juv.		......	......	31
92834	1408	.....do	Aug. 5, 1882	♀	338	162	58	31
101211	G. 80	... do	Apr. —1884	(♀) ad.	......	175	60	36
92835	2636	Velutschka, Kamtschtka	Sept. 21, 1883	♀	....	168	62	34

No. 89106.—Iris hazel. Bill black, with a small light spot between the nostrils and the tomium. Feet light brownish gray; webs darker brownish.

No 80107.—Iris hazel. Bill olive gray, blackish towards the point; culmen, except a V-shaped space along the angle of the forehead, with black spots; basal two-thirds of upper tomia ocher yellow, as also the lower jaw and mental angle. Feet brownish gray; webs darker than in the foregoing number.

No. 92834.—Iris dark yellowish gray.

The common Teal (*Tschirok* of the Russians) is the commonest freshwater duck of the region next to the Pintail. It breeds numerously in all suitable places on Bering Island, and a young bird, nearly fledged, which I shot on Copper Island July 26, 1883, proves that it also breeds there, where the localities will in any way allow it to do so, as for instance at Pestschanij Osero.

In 1883 the first Teal was seen in a flock of *Anas boschas*, near the village, on the 13th of April, and another was observed on the southern Kitovaja Reschka. The weather had changed the foregoing day from cold to mild, with rain and southerly wind. Between the 22d and 27th of April I found them very numerous along the southeastern shore, between Cape Tolstoj and Bujan.

In the beginning of August the young ones were already fit for food. I need not say that the young teals were looked upon as a very welcome change in our somewhat uniform diet of corned beef and salmon.

An egg cut from the oviduct, June 11, 1883 (No. 2196; U. S. Nat. Mus. No. 21803), measures 43 by 33.5mm.

66. Querquedula querquedula (LIN.).

1758.—*Anas querquedula* LIN., Syst. Nat., 10 ed., I, p. 126.—PALL., Zoogr. Ross. As., II, p. 264 (1826).—MIDDEND., Sibir. Reis., II, 2 (p. 229) (1853).—RADDE, Reis. Süd. Ost-Sibir., II (p. 371) (1863).—SWINH., P. Z. S., 1863, p. 324.—DYBOW. & PARVEX, J. f. Orn., 1868, p. 338.—PRZEW., Putesch. Ussur. (n. 202) (1870).—*Pterocyanea q.* TACZAN., J. f. Orn., 1873, p. 110.—*Id.*, Orn. Faun. Vost. Sibir., p. 70 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 46.—*Id.*, *ibid.*, 1883, p. 343.

1758.—*Anas circia* LIN., Syst. Nat., 10 ed., I, p. 127.—*Querquedula c.* SWINH., Ibis, 1863, p. 434.—*Id.*, *ibid.*, 1867, p. 407.—*Id.*, P. Z. S., 1870, p. 427.—*Id.*, *ibid.*, 1871, p. 418.—TACZAN., J. f. Orn., 1874, p. 337.—BLAKIST. & PRYER, Ibis, 1878, p. 214.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 185.—*Iid.*, *ibid.*, X, 1882, p. 98.—BLAKIST., Amend. List B. Jap., p. 34 (1884).—SEEB., Ibis, 1884, p. 175.—STEJNEGER, Naturen, 1884, p. 9.

The Garganey Teal is a bird of rather rare occurrence everywhere, and in Eastern Asia it is not more numerous than elsewhere. It has not been taken on the islands, and a male in very fine plumage, shot on a hunting excursion to Avatscha on the 25th of May, 1883, was the only specimen I obtained in Kamtschatka.

The measurements of this individual are as under:

U. S. Nat. Mus., *No.* 92,833; *L. Stejneger*, *No.* 2056. ♂ *ad. Avatscha*, *Kamtsch.*, *May* 25, 1883.

Total length, 380mm; tail beyond wings, 5mm; wing, 193mm; tail-feathers, 66mm; exposed culmen, 38mm; tarsus, 30mm; middle toe with claw, 42mm.

The following notes were taken down from the fresh bird: Iris yellowish brown; bill dark pearl gray, with an olive wash on culmen and anterior half; feet gray, with a faint brownish tinge on the joints; webs blackish. Rather fat. Testes very large, swollen.

67. Eunetta falcata (GEORGI).

1775.—*Anas falcata* GEORGI, Reis. Russ., I (p. 167).—PALL., Zoogr. Ross. As., II, p. 259 (1826).—MIDDEND., Sibir., Reis., II, 2 (p. 231) (1853).—KITTL., Denkw. II, p. 307 (1858).—SCHRENCK, Reis. Amurl., I, p. 476 (1860).—RADDE, Reis. Süd. Ost.-Sibir., II (p. 369) (1863).—SCHLEG., Mus. P. B. Anser, p. 72 (1866).—DYBOW. & PARVEX, J. f. Orn., 1868, p. 338.—PRZEW., Putesch. Ussur. (n. 201).—BLAKIST., Ibis, 1876, p. 335.—*Mareca f.* CASSIN, Exp. Jap. Perry, II, p. 231 (1857).—*Eunetta f.* SWINH., P. Z. S., 1871, p. 419.—*Id.*, Ibis, 1874, p. 164.—STEJNEGER, Naturen, 1884, p. 9. —*Querquedula f.* TACZAN., J. f. Orn., 1873, p. 109.—*Id.*, *ibid.*, 1874, p. 337.—*Id.*, *ibid.*, 1875, p. 257.—*Id.*, Orn. Faun. Vost. Sibir., p. 69 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 45.—*Id.*, *ibid.*, 1883, p. 343.—BLAKIST. & PRYER, Ibis, 1878, p. 214.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 105.—*Iid.*, *ibid.*, X, 1882, p. 98.—BLAKIST., Amend. List B. Jap., p. 9 (1884).—*Nettion f.* STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 71.

1776.—*Anas falcaria* Pall., Reis. Russ. Reich, III (p. 701).—Temm. & Schleg., Faun. Jap. Av. (p. —) (1849).—Swinh., Ibis, 1861, p. 345.—*Id.*, *ibid.*, 1862, p. 254.—*Id.*, P. Z. S., 1863, p. 324.—*Querquedula f.* Blakist., Ibis, 1862, p. 332.
1860.—*Querquedula multicolor* Swinh., Ibis, 1860, p. 67 (*nec* Scopoli?).

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When obtained.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail feathers.	Edges culmen.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
89112	1157	Bering Island	June 4, 1882	♂ ad.	435	......	......	......	......
92839	2047	Petropaulski, K	May 19, 1883	♂ ad.	494	0	245	71	43
92840	2053	Petropaulski, K	May 19, 1883	♂ ad.	......	......	243	73	43
92841	2061	Avatscha, K	May 25, 1883	♂ ad.	483	......	240	60	41

No. 89112.—Iris dark hazel. Bill uniform horny black. Feet delicate light olive gray, with yellowish tinge on the scutellæ of the tarsus; joints darker grayish; webs and under side blackish brown. Contents of stomach, leaves of plants.

No. 92839.—Bill blackish gray, with an olivaceous tinge. Feet, middle gray, joints darker, webs blackish. Tip of middle claw—legs being stretched backwards—20^{mm} beyond tip of tail. Extremely fat. Testes large, swollen. Œsophagus contained grass.

The Falcated Teal (*Kassatoj Selesenn* of the Russians), perhaps the prettiest species of the whole group, is a regular summer visitant to Kamtschatka, but seems not to be very numerous. During my trip to Petropaulski in the spring of 1883 I obtained several adult males, but it must be remembered that the rivers and lakes were not open yet, and that snow covered the ground everywhere, so that the ducks which had already arrived were compelled to await the opportunity of getting at their summer resorts, therefore congregating in large numbers at the mouths of the rivers.

It has been observed on Bering Island during the spring migration, and a few pairs may perhaps even breed, for instance, in the upper part of Kamennij Valley, but it is at all events a very rare bird there. A single specimen, a beautiful male, was procured on the 4th of June, 1882.

68. Mareca penelope (Lin.).

1758.—*Anas penelope* Lin., Syst. Nat., 10 ed., I, p. 126.—Pall., Zoogr. Ross. As., II, p. 251 (1826).—Nordmann in Erman's Verz., Th. Pfl., p. 18 (1835).—Temm. & Schleg., Faun. Jap Av. (p. 127) (1849).—Middend., Sibir. Reis., II, 2 (p. 229) (1853).—Kittl., Denkw., II, p. 292 (1858).—Schrenck, Reis. Amurl., I, p. 471 (1860).—Radde, Reis. Süd Ost-Sibir., II (p. 363) (1863).—Swinh., P. Z. S., 1863, p. 321.—Przew., Putesch. Ussur. (n. 199) (1870).—Blak., Ibis, 1876, p. 335.—*Mareca p.* Cassin, Exp. Jap. Perry, III, p. 231 (1857).—Swinh., Ibis, 1861, p. 345.—*Id.*, *ibid.*, 1867, p. 399.—*Id.*, *ibid.*, 1870, p. 366.—*Id.*, *ibid.*, 1875, p. 457.—*Id.*, P. Z. S., 1871, p. 418.—Blakist., Ibis, 1862, p. 332.—*Id.*, Chrysanth., 1883, p. 27.—*Id.*, Amend. List B. Jap., p. 9 (1884).—WHITELY, Ibis, 1867, p. 207.—DALL, Avif. Aleut. Isl. Unal. eastw., p. 5 (1873).—TACZAN., J. f. Orn., 1873, p. 110.—*Id.*, *ibid*, 1874, p. 337.—*Id.*, Orn. Faun. Vost. Sibir., p. 70 (1877).—*Id.*, Bull. Soc. Zool. France, 1876, p. 46.—*Id.*, *ibid.*, 1883, p. 344.—COUES in Elliott, Affairs Alaska, p 191 (1875).—HARTING, Fauna Prybil. Isl., p. 29 (1875).—BLAKIST and PRYER, Ibis, 1878, p. 213.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 184.—*Iid.*, *ibid.*, X, 1882, p. 97.—ELLIOTT, Monogr. Seal-Isl., p. 130 (1882).—NELSON, Cruise Corwin, p. 96 (1883).

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Expos. culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92829	2081	Bering Island	May 23, 1883	(♂) ad.	(481)	246	96	35	40	49
92830	1684	......do	Oct. 13, 1882	jun.	420	238	80	29	35	45

No. 92830.—Iris hazel. Bill bluish-gray; tips, including nail, blackish. Feet *bluish*-gray with a faint yellowish wash; webs blackish.

The "*Svistsch*" or "*Svistun*," of the Russians, visits Bering Island during the spring migration, but, as it seems, not regularly or in equal numbers every year. Thus in the spring of 1882 none were seen, while during the following spring, from the latter days of April to the first week of June, they were numerous along the beaches of the northwestern part of the island, from Ladiginsk to Tonkij Mys.

69. **Mareca americana** (GMEL.).

1788.—*Anas americana* GMEL., Syst. Nat., I, p. 526.—FINSCH, Abh. Brem. Ver., III, 1872, p. 66.—TURNER, Auk, 1885, p. 158.—*Mareca a.* DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 298.—BAIRD, Tr. Chicag. Acad., I, 1869 (p. 783).—BEAN, Pr. U. S. Nat. Mus., 1882, p. 166.—NELSON, Cruise Corwin, p. 96 (1883).

A single individual of the American Widgeon was found dead among the sand dunes near the village, Bering Island, on the 1st of May, 1883. It was moulting, the old plumage very worn, and new feathers protruding all over the body. Some storm had probably carried it astray, as this species is not known as an inhabitant of the Asiatic side of the Pacific Ocean. So far as I am aware, this is the first record of its having ever been obtained in Asia. It was a female, and very lean.

This specimen is almost identical with No. 31947 U. S. Nat. Mus.; a female from Lower California; shot in February, 1860. The only differences are that the chin and upper throat are more brownish and not spotted, and the chin partly shaded with black.

The measurements are as follows:

U. S. Nat. Mus. No. 92831, *L. Stejneger, No.* 2009. *Bering Island, May* 1, 1883. ♀ ad.

Total length, 448$^{\mathrm{mm}}$; tips of closed wings reach tip of tail; wing, 234$^{\mathrm{mm}}$; tail-feathers, 73$^{\mathrm{mm}}$; exposed culmen, 34$^{\mathrm{mm}}$; tarsus, 41$^{\mathrm{mm}}$; middle toe, with claw, 50$^{\mathrm{mm}}$.

Bill dark plumbeous blue; tips, including nail, tomia, and lower mandible, black; feet plumbeous, with a faint yellowish tinge; webs blackish.

70. Spatula clypeata (LIN.).

1758.—*Anas clypeata* LIN., Syst. Nat., 10 ed., I, p. 124.—PALL., Zoogr. Ross. As., II, p. 282 (1826).—NORDMANN in Erman's Verz., Thier. Pflanz., p. 18 (1835).—TEMM. & SCHLEG., Faun. Jap. Av. (p. 128) (1849).—MIDDEND., Sibir. Reis., II, 2 (p. 233) (1853).—KITTL, Denkw., II, p. 294 (1858).—SCHRENCK, Reis. Amurl., I, p 481 (1860).—RADDE, Reis. Süd. Ost-Sibir., II (p. 353) (1863).—SWINH., P. Z. S., 1863, p. 324.—PRZEW., Putesch. Ussur. (n. 206), 1870.—BLAKIST., Ibis, 1876, p. 335.—*Rhynchaspis c.* SWINH., Ibis, 1861, p. 345.—*Id.*, *ibid.*, 1862, p. 254 —*Id.*, *ibid*, 1867, p. 338.—TACZAN., J. f. Orn., 1873, p. 110.—*Id.*, *ibid.*, 1874, p. 337.—*Id.*, Orn. Faun. Vost Sibir., p. 20 (1877).—*Id*, Bull. Soc. Zool. France, 1877, p. 46.—*Id.*, *ibid.*, 1883, p. 343.—*Spatula c.* BLAKIST., Ibis, 1862, p. 332.—*Id.*, Amend. List B. Jap., p. 9 (1884).—WHITELY, Ibis, 1867, p. 207.—DALL & BANNIST., Tr. Chicag. Ac., I, 1869, p. 297.—SWINH., P. Z. S., 1871, p. 418.—*Id.*, Ibis, 1875, p. 457.—BLAKIST. and PRYER, Ibis, 1878, p. 214.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 185.—*Iid.*, *ibid.*, X, 1882, p. 98.—NELSON, Cruise Corwin, p. 96 (1883).

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Expos. culmen.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
92838	2033	Petropaulski	May 5, 1883	♂ ad.	473	0	228	77	65
92837	2038	......do	May 17, 1883	♂ ad.	520	10	237	85	63
92836	2114	Bering Island	May 31, 1883	♂ ad.	499	10	236	83	65

No. 92838.—Iris, pale-yellow; bill black, with the extreme point of the mental angle pale yellowish; feet pale reddish orange; webs violet gray, when alive, the violet tinge disappearing as soon as dead, the color of the web becoming brownish afterwards. Not fat. Tips of tail, tips of closed wings, and middle claw, legs stretched backwards, meet in one point.

The Shoveller, known to the natives by its Russian name, "*Soksun*," is one of the rarer ducks on Bering Island. A few pairs breed probably in the open valleys on the southeastern shore, as, for instance, at Polavino. In 1883 the first ones were observed by me, on the 24th of April, on the beach between Polavino and Slastnoj. At the village they were seen at the end of May, and during the first week of June.

During my stay in Petropaulski, from the middle of May, 1883, to the end of the month, I found this duck very common at the mouth of the rivers, which at that time were still partly ice-bound. It was then, by far, easier to approach than any other of the many kinds of ducks assembled there waiting for the general breaking up of the rivers.

71. **Aythya fuligula** (Lin.).

1758.—*Anas fuligula* Lin., Syst. Nat., 10 ed., I, p. 128.—Pall., Zoogr. Ross. As., II, p. 265.—Temm. & Schleg., Faun. Jap. Av. (p.—) (1879).—Middend., Sibir. Reis., II, 2 (p. 47) (1853).—Schrenck, Reis. Amurl., I, p. 484 (1860).—Radde, Reis. Süd. Ost-Sibir., II, (p. 375) (1863).—*Platypus f.* Dybow. & Parvex, J. f. Orn., 1868, p. 339.

1816.—*Anas cristata* Leach, Syst. Cat. M. B. Br. Mus., p. 39 (*nec* Gmel. 1788).—*Fuligula c.* Swinh., Ibis, 1861, p. 345.—*Id.*, *ibid.*, 1862, p. 254.—*Id.*, *ibid.*, 1867, p. 399.—*Id.*, P. Z. S., 1863, p. 324.—Przew., Putesch. Ussur. (n. 209) (1870).—Taczan., J. f. Orn., 1873, p. 110.—*Id.*, *ibid.*, 1874, p. 337.—*Id.*, Orn. Faun. Vost. Sibir., p. 70 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 47.—*Id.*, *ibid.*, 1883, p. 344.—Blakist, Ibis, 1887, p. 147.—*Id.*, Amend. List B. Jap., p. 9.—Blakist. & Pryer, Ibis, 1878, p. 214.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 186.—*Iid.*, *ibid*, X, 1882, p. 99.—Seeb., Ibis, 1879, p. 22.—*Fulix c.* Swinh., P. Z. S., 1871, p. 419.

1826.—*Anas colymbis* Pall., Zoogr. Ross. As., II, p. 266.

Although not uncommon in Kamtschatka this duck is only of casual occurrence on Bering Island where a single pair was shot on the 7th of June, 1883, in Kamennij Valley, being in company with several *A. marila*. Only the male was fit for preservation. It is probable that another male was shot during my absence in Petropaulski, in the latter part of May.

The measurements are as follows:

♂ *ad. U. S. Nat. Mus. No.* 92845; *L. Stejneger No.* 2134. *Bering Island, June* 7, 1883.

Total length, 417^{mm}. Tail beyond wings, 17^{mm}. Wing, 199^{mm}; tail-feathers, 53^{mm}; culmen, 41^{mm}; tarsus, 36^{mm}; middle toe with claw, 61^{mm}.

Iris clear gamboge yellow. Bill grayish-blue; nail black. Feet gray, with a faint olive tinge; joints darker; webs blackish. Very fat.

72. **Aythya marila** (Lin.).

1761.—*Anas marila* Lin., Faun. Svecica, 2 ed., p. 39.—Middend., Sibir. Reis., II, 2 (p. 328) (1853).—Radde, Reis. Süd. Ost-Sibir., II (p. 375) (1863).—Przew., Putesch. Ussur. (n. 210) (1870).—*Fuligula m.* Swinh., Ibis, 1861, p. 345.—*Id.*, *ibid.*, 1862, p. 254.—*Id.*, P. Z. S., 1863, p. 324.—Whitely, Ibis, 1867, p. 208.—Taczan., J. f. Orn., 1873, p. 110.—*Id.*, *ibid.*, 1876, p. 202.—*Id.*, Orn. Faun. Vost. Sibir., p. 70 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 47.—*Id.*, *ibid.*, 1883, p. 344 (*marita*, err. typ.).—Blakist. & Pryer, Ibis, 1878, p. 214.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 185.—*Iid.*, *ibid.*, X, 1882, p. 98.—Blakist., Amend. List B. Jap., p. 9 (1884).—*Platypus m.* Dybow. & Parvex, J. f. Orn., 1868, p. 339.—*Fulix m.* Swinh., P. Z. S., 1871, p. 419.—*Id.*, Ibis, 1875, p. 457.

The Scaup Duck of the region is in every particular identical with the common form inhabiting the Atlantic portion of the palæarctic continent, the true *A. marila*, from which is distinguishable a representative of the American *Aythya affinis* (EYTON), found in China and Japan, and entitled to recognition as *Aythya affinis mariloides* (VIG.). Nor must *A. marila* be confounded with its American subspecies *Aythya marila nearctica* STEJNEGER, which differs from the true *marila* in exactly the same manner as does *A. affinis* from *A. affinis mariloides*. The difference in size and in the light markings on the primaries is easily observable both in the males and the females. The males have the same additional distinguishing characters, and their differences may be tabulated thus:

*a*¹. Size smaller; reflections on head chiefly purple; flanks narrowly vermiculated with dusky.
  *b*¹. Primaries from the fourth quill without whitish on the inner web, the latter being only a trifle paler than the rest of the quills.

1. *A. affinis* (EYTON).

Hab.—Nearctic Region, generally.

  *b*². Primaries from the fourth with a distinct white area on the inner web.

1*a*. *A. affinis mariloides* (VIGORS).

Hab.—Pacific coast of Asia, from Japan southward.

*a*². Size larger; reflections on head green; Flanks uniform white without dusky vermiculations.
  *b*¹. Primaries from the fourth quill with a distinct white area on the inner web.

2. *A. marila* (LIN.).

Hab.—Palæarctic Region, generally.

  *b*². Primaries from the fourth quill with a grayish—but not white—area on the inner web.

2*a*. *A. marila nearctica* STEJNEGER.

Hab.—Nearctic Region. Specimens examined from Alaska, Pacific coast, Guatemala, Arctic and Atlantic coasts, and interior of the United States.

Quite extensive series have been examined and the characters found to hold good in every single instance. As will be seen, the Palæarctic forms agree in the pattern of the wing, having a quite pronounced white area on the inner webs of the inner primaries, a design only faintly marked in their American representatives, which have the corresponding area dull brownish gray.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89111	1144	Bering Island	June 2, 1882	♂ ad.	465	211	55	41	38	67
92842	1480	......do	June 20, 1882	(♂) ad.	......	212	55	43	39	67
89101	1145	......do	June 2, 1882	♀ ad.	436	200	54	43	37	62
92843	1481	......do	June 20, 1882	(♀) ad.	......	204	52	41	37	65
89100	1139	......do	June 1, 1882	♀ ad.	436	215	56	44	40	67
92844	1401	......do	Aug. 5, 1882	pull.	218	......	......	24	23	33
......	1402	......do	Aug. 5, 1882	pull.	290	......	......	......	......	......

No. 89111.—Iris rich brown-yellow; bill clear bluish gray; nail and naked skin on mental angle black; feet dirty gray with a faint tinge of bluish; webs and soles blackish.

No. 89101.—As foregoing, but bill with a shade of brownish black on culmen, and feet more distinctly bluish.

No. 92844.—Iris dirty yellow; bill dark bluish gray; lower mandible flesh-colored; feet gray, with a slight greenish tinge; webs blackish, yellowish along the toes.

The Scaup Duck is known to the natives by the Russian name "*Tschernik*," being one of the most numerous ducks breeding on Bering Island. They arrive in the beginning of May (in 1883 on the 5th), and soon disperse over the island, taking up their residence at the numberless lakes, lakelets, and ponds. In the beginning of August the young are seen swimming with their parents.

The eggs measure as follows:

U. S. Nat. Mus. No.	L. Stejneger No.	Diameters.	Date.	Locality.	Remarks.
		mm.			
21793	1394	63 by 43 66 by 43.5	July 1882	Bering Island	
21792	1161	62.5 by 43 63 by 43 62 by 43 62 by 42 64 by 42 63.25 by 42.5	June 6, 1882	......do	Full clutch.

73. Clangula clangula (Lin.).

1758.—*Anas clangula* Lin., Syst. Nat., 10 ed., I, p. 125.—Pall., Zoogr. Ross. As., II, p. 271 (1826).—Temm. & Schleg., Faun. Jap. Av. (p. 128) (1849).—Middend., Sibir. Reis., II, 2 (p. 287) (1853).—Kittl., Denkw., II, pp. 248, 278 (1858).—Schrenck, Reis. Amurl., I, p. 481 (1860).—Radde, Reis. Süd. Ost-Sibir., II, p. 374 (1863).—*Fuligula c.* Przew., Putesch. Ussur. (n. 207) (1870).—*Bucephala c.* Swinh., P. Z. S., 1871, p. 419.—*Id.*, Ibis, 1877, p. 147.—*Glaucion c.* Taczan., J. f. Orn., 1873, p. 110.—*Id.*, *ibid.*, 1874, p. 337.—*Id.*, Orn. Faun. Vost. Sibir., p. 71 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 47.—*Id.*, *ibid.*, 1883, p. 344.

1758.—*Anas glaucion* Lin., Syst. Nat., 10 ed., I, p. 126 (*nec* Pall.).—*Clangula g.* Swinh., Ibis, 1861, p. 345.—Whitely, Ibis, 1867, p. 208.—Dybow. & Parvex, J. f. Orn., 1868, p. 339.—Blakist. & Pryer, Ibis, 1878, p. 215.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 186.—*Iid.*, *ibid*, X, 1882, p. 99.—Blakist., Amend. List B. Jap., p. 9 (1884).

1826.—*Anas hyemalis* Pall., Zoogr. Ross. As., II, p. 270 (*nec* Lin. 1758).

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Expos. culmen.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
92869	1762	Bering Island	Nov. 29, 1882	♂ jun	468	......	202	83	33
92870	1771	......do	Dec. 3, 1882	♀	400	29	194	68	33

No. 92869.—Iris light brownish-yellow. Bill olive black, above the nostrils lighter olive-gray. Feet yellowish-brown, joints and underside darker brownish; webs blackish-brown. In stomach only plenty of small stones.

No. 92870.—Bill olive-black, lighter olive-gray between nail and nostrils and on the culmen between the latter.

The "*Gogol*" of the Russians occurs in small numbers on Bering Island during the winter. They do not breed there, and the latest observed—three females and two males—were seen at Saranna Reschka on March 18, 1883. It was one of the most difficult ducks to approach, on account of its extreme shyness.

CHARITONETTA* n. gen.

(Type *Anas albeola* Lin.)

< 1758.—*Anas* Lin., Syst. Nat., 10, ed., I, p. 124.

< 1824.—*Clangula* Stephens, Gen. Zool., XII, pt. ii, p. 184.

< 1828.—*Fuligula* Bonap., Syn., p. 394.

< 1858.—*Bucephala* Baird, B. North Amer., p. 797 (type *A. albeola* Lin.) (nec *Bucephalus* Baer, 1827, qui *Verm.*, nec Smith, 1829, qui *Rept.*, nec *Bucephalon* Lesson, 1836, quod *Acaleph.*).

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* *Χάρις*, *χάριτος*, grace; *νῆττα*, *ἡ*, a duck.

Bill short, somewhat depressed; nostrils in the anterior portion of the posterior half of the bill, not pervious, rather narrow, and with an acute tubercle visible at the posterior corner, lamella not visible below tomia; border of frontal feathering angular. Outer toe without claw, decidedly longer than middle one; tip of inner toe, without claw, reaches only to the second joint of middle toe; hind toe very short. First primary longest; none of the primaries sinuated in the inner web. Tail rather long, more than twice the length of the tarsus; reaches beyond the folded wings by nearly twice the length of culmen, graduated, of 16 rectrices. Feathering of the head of the male particularly puffy.

The Buffle-head is as well entitled to generic rank as the other genera among the *Fuligulinæ*, differing, as it does, in many important structural features from the two species *Clangula glaucion* and *islandica*. The chief differences may by tabulated thus:

Charitonetta.	*Clangula.*
Nostrils behind the middle of the bill, being situated in the anterior portion of the posterior half.	Nostrils in front of the middle of the bill, being situated in the posterior portion of the anterior half.
Nostrils rather narrow and the tubercle visible.	Nostrils rather broad, tubercle not visible.
Lamellæ not at all visible below tomia.	Tips of lamellæ visible below tomia at the middle of the commissure.
Outer toe, without claw, decidedly longer than middle one.	Outer and middle toes of equal length.
Tip of inner toe, without claw, reaching only to the second joint of middle toe.	Tip of inner toe, without claw, reaching considerably beyond second joint of middle toe.
Tail rather long, more than twice the length of the tarsus, reaching beyond the folded wings by nearly twice the length of the culmen.	Tail rather short, not twice as long as the tarsus, reaching beyond the wings by less than the length of the culmen.

The above characters are taken from the birds when still in the flesh, and the accompanying figures, showing the difference in the bill of the two genera were drawn before the birds were skinned.

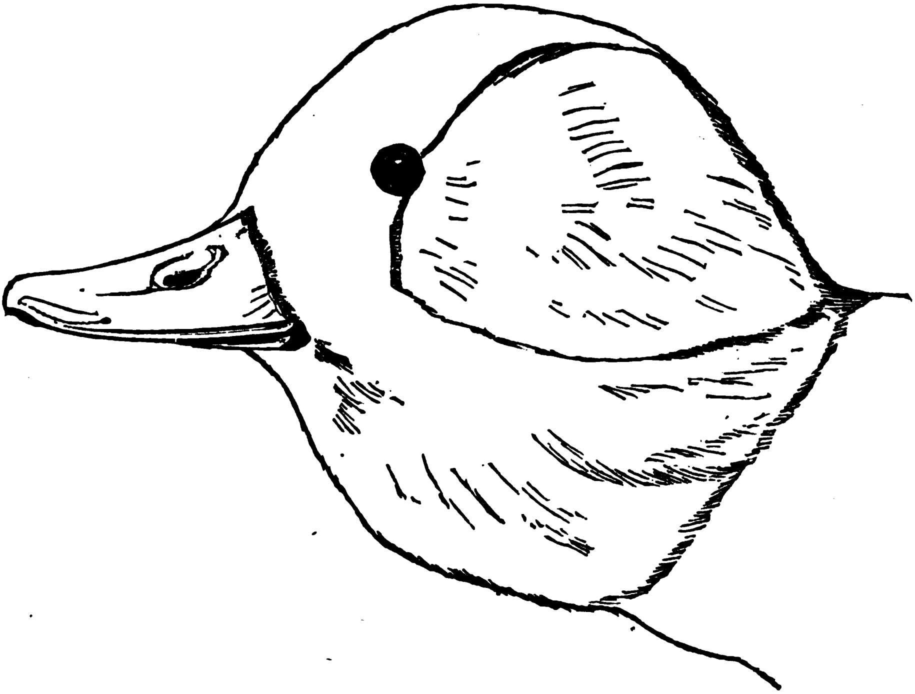

FIG. 6.—*Charitonetta albeola*, ♂ ad. Bering Island, January 19, 1883.

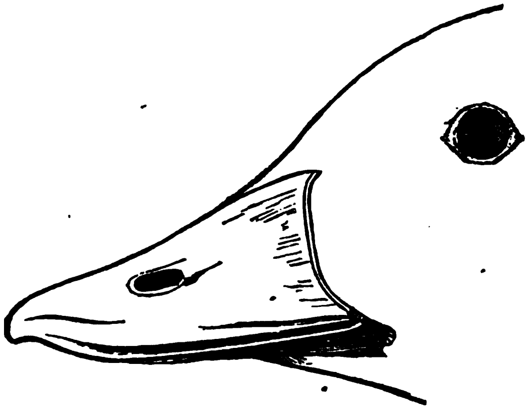

FIG. 7.—*Clangula clangula*, ♂ jun. Bering Island, November 29, 1882.

74. **Charitonetta albeola** (LIN.).

1758.—*Anas albeola* LIN., Syst. Nat., 10 ed., I, p. 124.—*Bucephala a.* DALL & BANNIST., Tr. Chicag. Acad., I, 1869, p. 298.—*Clangula a.* BEAN, Pr. U. S. Nat. Mus., 1882, p. 167.—HARTLAUB, J. f. Orn., 1883, p. 282.—TURNER, Auk, 1885, p. 158.

A beautiful male of this pretty species was obtained at Severnij, Bering Island, on the 19th of January, 1883. It was in company with another male and a female of the same species. As the Buffle-head is a strictly American bird, its appearance on the coast of the Commander Islands must be regarded as merely accidental. None of the inhabitants had ever seen it.

This is the first recorded instance of this species ever having been met with in any part of Asia.

The dimensions of this specimen were as follows:

U. S. Nat. Mus. No. 92871; *L. Stejneger No.* 1873. ♂ *ad. Bering Island, January* 19, 1883.

Total length, 372^{mm}; tail beyond folded wings, 55^{mm}; wing, 171^{mm}; tail-feathers, 76^{mm}; graduation of tail, 27^{mm}; bill from tip to frontal feathers on culmen, 28^{mm}; tarsus, 35^{mm}; middle toe with claw, 59^{mm}.

Remarks.—Iris dark brown. Bill bluish gray, lighter and somewhat tinged with yellow at tip, on culmen, along tomia, and round the nostrils, darker at base and on the naked skin of the chin-angle. Tongue light flesh-colored. Feet flesh-colored, with a light tinge of violet-rosy; webs a little darker brownish, dirty-looking; nails black. Stomach contained gravel only. Very fat.

75. **Histrionicus histrionicus** (LIN.).

1758.—*Anas histrionica* LIN., Syst. Nat., 10 ed., I, p. 127.—PALL., Zoogr. Ross. As., II, p. 273 (1826).—TEMM. and SCHLEG., Faun. Jap. Av., p. 129 (1849).—MIDDEND., Sibir. Reis., II, 2, p. 537 (1853).—KITTL., Denkw., II, p. 347 (1858).—SCHRENCK, Reis. Amurl., I, p. 483 (1860).—RADDE, Reis. Süd. Ost-Sibir., II, p. 374 (1863).—SWINH., P. Z. S., 1863, p. 324.—*Clangula h.* WHITELY, Ibis, 1867, p. 208.—DYBOW. & PARVEX, Journ. f. Orn., 1868, p. 339.—BLAKIST., Ibis, 1876, p. 335.—*Id.*, Amend. List B. Jap., p. 9 (1884).—SWINH., Ibis, 1877, p. 147.—BLAKIST. and PRYER, Ibis, 1878, p. 215.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 186.—*Iid.*, *ibid.*, X, 1882, p. 99.—SEEB., Ibis, 1879, p. 22.—HARTL., J. f. Orn., 1883, p. 283.—*Fuligula h.* PRZEW., Putesch. Ussur. (n. 208).—*Harelda h.* FINSCH, Abh. Brem. Ver., III, 1872, p. 67.—TACZAN., J. f. Orn., 1873, p. 110.—*Id.*, *ibid.*, 1874, p. 337.—*Id.*, *ibid.*, 1875, p. 257.—*Id.*, Orn. Faun. Vost. Sibir., p. 71 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 47.—*Id.*, *ibid.*, 1883, p. 344.—*Histrionicus h.* TURNER, Auk, 1885, p. 158.

1758.—*Anas minuta* LIN., Syst. Nat., 10 ed., I, p. 127.—*Histrionicus m.* NELSON, Cruise Corwin, p. 98 (1883).

1853.—*Anas histrionis* MIDDEND., Sibir. Reis., II, 2, pl. xxii.

1855.—*Clangula torquata* BREHM, Vogelf, p. 385.—*Histrionicus t.* BAIRD, Tr. Chicag. Acad., I, 1869 (p. 799).—DALL and BANNIST., Tr. Chicag. Acad., I, 1869, p. 289.—DALL, Avif. Aleut. Isl. Unal. eastw., p. 5 (1873).—COUES in Elliott's Alask. Affairs, p. 191 (1875).—ELLIOTT, Monogr. Seal-Isl., p. 130 (1882).

The above synonymy shows, at least partly, how this species has been placed now in one, now in another genus, by those authors who are afraid of many genera, merely because they are many. Nothing indicates more plainly that the Harlequin Duck is misplaced in all of them, and *Histrionicus*, in fact, is one of the best marked genera in the whole group. Besides all the other characters, it has a peculiarity of its own, which at once distinguishes it from all others of its kind, the soft, naked membrane at the base of the upper mandible overlapping the tomium and concealing the corner of the mouth and the base of the lower mandible for a distance of not less than 9^{mm}.

This membrane shrinks considerably when the skin is prepared and dried. The true size and structure of the nostrils and many other parts of the bill are usually distorted in museum specimens. I, therefore, wrote down a synoptical comparison of the bills of *Histrionicus minutus* and *Harelda hyemalis*, with the fresh specimens before me, which I think it may be of some interest to reproduce; the notes are as follows:

Harelda.	*Histrionicus.*
Nail of upper mandible distinct, vaulted, narrower than the bill.	Nail of upper mandible indistinct, flat, occupying the whole breadth of the bill.
Tomia of upper mandible bent upwards toward the tip.	Tomia of upper mandible straight to the tip.
Lamellæ of upper mandible few, distant, and, in the hind part of the commissure, long, pendant, and visible below the tomium.	Lamellæ of upper mandible numerous, close together, and not visible below the tomium.
Edges of nostrils not swollen or raised above the surface of the bill..	Edges of nostrils swollen, raised above the surface of the bill.
Base of upper mandible without overhanging membrane.	Base of upper mandible with a soft, naked membrane overlapping the tomium.
Upper mandible of equal breadth to a point beyond the nostrils.	Upper mandible diminishing in breadth gradually from the base.
Frontal feathering proceeds farther on the bill, almost as far as the hind border of the nostrils, the mesial apex being rounded and the lateral border with a prominent but obtuse angle above, while concave below.	Frontal feathering does not proceed so far on the bill as the hind border of the nostrils; mesial apex pointed; loral border convex.
Lower mandible with a distinct "nail."	Lower mandible without distinct "nail."
Lamellæ of the lower jaw few, distant, and very prominent, distinctly visible outside of the tomia when viewed from below.	Lamellæ of lower jaw numerous, close together, and hardly perceptible outside of the tomia when viewed from below.
Lateral outlines of lower jaw, viewed from below, decidedly curved inward.	Lateral outlines of lower jaw, viewed from below, straight, converging gradually from the base.
Length of symphysis less than the breadth of the lower jaw at the hind border of the symphysis.	Length of symphysis greater than the breadth of the lower jaw at the hind border of the symphysis.
Feathering on mental angle pointed anteriorly.	Feathering on mental angle rounded anteriorly.
Distance from mental feathering to tip of lower jaw less than from the former to corner of mouth.	Distance from mental feathering to tip of lower jaw much greater than from the former to corner of mouth.

I have compared the birds collected by me, and numerous specimens from Alaska, with birds obtained from the Atlantic shores, without finding any tangible difference.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89110	1059	Bering Island	May 18, 1882	♂ ad.	434	200	98	28	40	58
92862	1738	....do	Nov. 18, 1882	♂ ad.	439	203	104	29	39	60
92860	1750	....do	Nov. 25, 1882	♂ ad.	446	196	95	26	40	......
92859	1878	....do	Jan. 20, 1883	♂ ad.	425	197	87	27	38	......
92861	1958	....do	March 22, 1883	♂ ad.	438	198	100	27	39	......
92863	1739	....do	Nov. 18, 1882	♂ jun.	412	183	73	27	39	......

No. 89110.—Iris dark hazel. Bill, bluish gray; tip lighter, with a yellowish wash all over; naked skin of mental angle, violet black. Feet brownish gray; joints darker; webs blackish.

No. 92862.—Iris dark hazel. Bill bluish white, tinged with yellowish, becoming dark, bluish gray behind the middle of the nostrils. Feet grayish brown; joints darker; webs blackish. In the crop a *Cottus*, 50^{mm} long, a small crab and two *Littorinæ*.

No. 92861.—Iris dark hazel. Bill in front of nostrils, as also the swollen border of the latter, light bluish gray, basal part dark olive gray; nail hardly appreciable (except to the touch, as it is hard while the rest of the bill soft), 14^{mm} long, and faintly tinged with yellowish; chin-angle blackish. Feet grayish brown; webs and below blackish.

No. 92863.—Iris dark hazel. Bill dark bluish gray; toma and borders of nostrils lighter; chin-angle black. Feet light-yellowish gray, with darker joints; tarsus behind, webs, and below, blackish.

The color of the soft parts of the adult No. 92862 and the young No. 92863, both males, and shot on the same date, is noteworthy.

The "*Kamenuschka*," as the Harlequin Duck is styled on the islands, inhabits the rocky shores of the Commander Islands in large numbers all the year round, and larger or smaller flocks may almost at any time be seen diving and swimming near the breakers where the high and inaccessible promontories tower up from the sea, or long, shallow, and stony reefs stretch out from the shore for a quarter of a mile and more. It loves the surf and rocks, and is perhaps more expert in diving "at shot" than any other duck, not being particularly shy, however.

I watched their large assemblages during the whole spring of 1883, and noted solid flocks at Bering Island as late as the middle of June, and on Copper Island, on July 1, the latter, however, consisting of adult males, all in their most beautiful plumage. Nevertheless, it is not found breeding on the islands. The natives or residents knew of no instance of its eggs or small young having ever been taken or seen; nor did I succeed in finding any evidence of its breeding; so that I have little doubt that the numerous flocks which remain over summer consist of birds not propagating during that season, for some reason or another. It is also probable that the flocks observed on July 1, and later, exclusively consisting of males in full adult plumage, are composed of adult males having already left the females and young on the breeding haunts, which I suspect to be the interior mountainous parts of Kamtschatka. It is probably the occurrence during the breeding season of similar flocks which has given rise to the supposition of the breeding of birds, like *Eniconetta stelleri* and *Somateria spectabilis*, in the latitudes of Kamtschatka and the Aleutian chain.

76. Harelda hyemalis (LIN.).

1758.—*Anas hyemalis* LIN., Syst. Nat., 10 ed., I, p. 126 (*nec* PALL.).—*Harelda h.* TURNER, Auk, 1885, p. 158.

1766.—*Anas glacialis* LIN., Syst. Nat., 12 ed., I, p. 203.—PALL., Zoogr. Ross. As., II, p. 276 (1826).—MIDDEND., Sibir. Reis., II, 2, p. 236 (1853).—RADDE, Reis. Süd. Ost- Sibir., II (p. 374) (1863).—*Harelda g.* SWINH., P. Z. S., 1863, p. 324.—*Id.*, *ibid.*, 1871, p. 419.—*Id.*, Ibis, 1877, p. 147.—WHITELY, Ibis, 1867, p. 208.—DALL and BANNIST., Tr. Chic. Acad., I, 1869, p. 298.—BAIRD, Tr. Chic. Acad., I, 1869, p. 800.—FINSCH, Abh. Brem. Ver., III, 1872, p. 67.—DALL, Avif. Aleut. Isl. Unal. eastw. p. 5 (1873).—*Id.*, Avif. Aleut. Isl. west Unal. p. 7 (1874).—COUES, in Elliott's Affairs Alaska, p. 191 (1875).—TACZAN., J. f. Orn., 1876, p. 202.—*Id.*, Orn. Faun. Vost. Sibir., p. 71 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 48.—*Id.*, *ibid*, 1883, p. 344.—BLAKIST. and PRYER, Ibis, 1878, p. 214.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 186.—*Iid.*, *ibid.*, X, 1882, p. 100.—SEEB., Ibis, 1879, p. 23.—ELLIOTT, Monogr. Seal-Isl., p. 130 (1882).—NELSON, Cruise Corwin, p. 99 (1883).—HARTL., J. f. Orn., 1883, p. 282.—BLAKIST., Amend. List Birds Jap., p. 20 (1884).

As the changes of the different plumages of this species are now very well known, no further remarks are here required. I may mention, however, that the males commenced assuming their dark nuptial plumage about the middle of April, most of them being in full change in the latter part of this month. The time varies a great deal in different individuals, so that while two males shot on the 2d and 3d of June were in full nuptial plumage, another shot three days later had not passed through more than half the change.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89113	1143	Bering Island	June 2, 1882	♂ ad.	*422+111	214	204	28	33	......
89114	1149	......do	June 3, 1882	♂ ad.	*428+88	209	193	26	31	55
89115	1166	......do	June 6, 1882	♂ ad.	....	225	203	27	36	53
92864	1773	......do	Dec. 16, 1882	♂ ad.	*460+91	214	220	28	35	......
92865	1870	......do	Jan. 22, 1883	♂ ad.	*445+89	216	187	27	35	......
89116	1113	......do	May 29, 1882	♀ ad.	382	199	61	25	34	54
92866	1749	......do	Nov. 26, 1882	♀	387	188	56	26	32	52
92867	1413	......do	Aug. 7, 1882	pull.	245	......	......	18	27	35
92868	2332	......do	July 9, 1883	pull.	....	.....	......	11	17	28

* From tip of bill to tip of tail-feathers next to the middle pair + the length of the latter beyond the others.

No. 89113.—Iris light yellowish hazel. Bill bluish black with a broad, angulate band behind the nail of a rosy flesh-color shaded with bluish toward the nail and on the culmen; on the lower mandible the nail is more bluish and the rosy band more orange. Feet light bluish white; joints darker bluish gray; sole, webs, and nails blackish.

No. 92864.—Iris light hazel. Bill black with the rosy band fading into light flesh-color on the lower mandible. Feet pure bluish white; joints dark bluish gray; sole and webs blackish. Tips of closed wing reach tips of shorter tail-feathers; toes, stretched backwards, reach end of longest *white* tail feathers. Outer toe longer than middle one; inner toe, without claw, reaches second joint of middle-toe.

No. 98116.—Iris light yellowish hazel. Bill bluish gray, darker towards the tip; nail blackish; naked skin of mental angle dirty flesh-color. Anterior side of tarsus, toes, and webs along the toes bluish white; posterior surface of tarsus, joints, webs, and under side of toes blackish. In the aviduct was an egg 55mm long. Two largest eggs of the ovary measured 32 and 25mm.

No. 92867.—Iris dark brown. Bill dark gray, with greenish tinge. Feet light bluish gray, with yellowish tinge; darker on tarsus and joints; webs blackish.

The "*Safka*" is one of the commonest ducks on Bering Island, and is a resident throughout the whole year. It breeds on all the lakes and lakelets of the island.

It also frequents the neighboring Copper Island, but no instance of its having bred there was known by the natives.

The eggs of a full clutch, consisting of six (No. 2199, U. S. Nat. Mus. No. 21783), measure as follows: 54 by 37.5mm, 51 by 39mm, 50 by 36.25mm, 53 by 38.5mm, 51 by 37mm, 53 by 34mm.

77. Eniconetta stelleri (Pall.).

1769.—*Anas stelleri* PALL., Spicil. Zool., VI, p. 35.—*Id.*, Zoogr. Ross. As., II, p. 238 (1826).—MIDDEND., Sibir. Reise, II 2 (p. 234) (1853).—*Polysticta s.* DALL and BANNIST., Tr. Chicag. Acad., I, 1869, p. 309.—DALL, Avif. Aleut. Isl. Unal., eastw., p. 6 (1873).—*Id.*, Avif. Aleut. Isl. west Unal., p. 7 (1874).—NELSON, Cruise Corwin, p. 99.—*Somateria s.* TACZAN., Orn Faun. Vost. Sibir., p. 72 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 48.—*Id.*, *ibid.*, 1883, p. 344.—*Eniconetta s.* TURNER, Auk, 1885, p. 158.

1786.—*Anas dispar* SPARRMANN, Mus. Carlson. (tbb. 7 and 8).—*Someteria dispar* BLAKIST., Ibis, 1876, p. 335.—*Id.*, Amend. List B. Jap., p. 29 (1884).—BLAKIST. and PRYER, Ibis, 1878, p. 215.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 187.—*Iid.*, *ibid.*, X, 1882, p. 100.

The bill of this species is very peculiar, and would alone justify its separation as the type of a distinct genus. Especially characteristic are the soft lobes formed by the tomia of the upper mandible in their anterior half. When dried they roll up so as to inclose the lower mandible and become hard, the lateral outline thereby being considerably changed, becoming unduly narrowed towards the tip.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Culmen.	**Tarsus.**	**Middle toe with claw.**
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92854	1790	Bering Island.......	Dec. 10, 1882	♂ ad.	435	......	205	90	37	**38**	......
92852	1797	......do............	Dec. 13, 1882	♂ ad.	445	......	213	94	36	**41**	**63**
92855	1798	......do............	Dec. 13, 1882	♂ ad.	455	.....	219	95	38	**40**	**61**
92853	1933	......do............	Mar. 4,1883	♂ ad.	462	......	221	87	37	**39**	**59**
92851	1963	......do............	Apr. 2, 1883	♂ ad.	440	41	209	88	38	**40**	......
92857	1740	......do............	Nov. 20, 1882	♂ jun.	392	.....	189	69	37	**38**	.....
92856	1746	......do............	Nov. 24, 1882	♂ jun.	432	......	198	74	36	**39**	**57**
92858	2003	......do............	Apr. 25, 1883	♀ ad.	450	42	208	80	38	**40**	......

No. 92854.—Iris dark brown. Bill, light bluish gray; nail somewhat yellowish; skin of mental angle light as the bill. Feet gray, with a tinge rather brownish than bluish; joints and tarsus behind darker; webs blackish.

No. 92851.—Iris dark brown. Bill, light bluish gray; naked mental angle, hardly darker toward the feathering. Feet brownish gray; webs and below blackish. The crop contained green Algæ, four different species of Mollusks, at least six species of Amphipods, and one *Idotæa*.

No. 92857.—Iris dark brown. Bill, grayish blue, as is also the naked space of the mental angle. Feet of a brownish pearl-gray, darker on the joints and behind; webs blackish. New feathers in their sheaths, especially in the head, in the armpits, and on the rump.

No. 92856.—Like foregoing, only feet pure gray without any brownish tinge. New feathers on head, breast, and scapular region.

No. 92858.—New feathers in their sheaths all over the body. Extremely fat.

Nothing special is to be remarked about the plumage and the color of the specimens enumerated above, except that a narrow whitish spot is found in two of the old males on the outmost pair of rectrices, near their tip, while wanting in the other specimens (cf. also Keyserling and Blasius, Wirbelth. Europ., p. 230, and Naumann, Naturgesch. Vög. Deutschl., XII, p. 247). Another noteworthy feature is that in No. 92853, an adult male, the first primary in the left wing has the greater part of the inner web pure white, while some of the inner primaries and the hand-coverts likewise show signs of partial albinismus.

UofM

Steller's Duck made its appearance in 1882, about the 1st of November, at which time large flocks were observed, but no specimen was secured before the 20th, although several were shot, because the current would carry them away. They remained all winter round the coast, preferring the rockiest parts and the places where the breakers were most violent. Although very numerous during the whole winter, in spring their number was enormously increased, and immense flocks, covering many acres, could be seen floating on the sea, a quarter to a half of a mile off the shore, during April. The favorite places at that time were Tonkij Mys on the western coast, and the whole line of reefs from Staraja Gavan to Tolstoj Mys on the eastern side. Towards the end of this month their number decreased considerably, and I find among my notes that on the 20th of April, and the 2d, 4th, and 5th of May only a few were seen. On the 8th, half a dozen males and females were observed at Toporkoff Islet, but on the 10th large flocks were again met with between Kamennij Reschka and Tonkij Mys. They disappeared altogether about the 25th of May.

Prof. W. H. Dall, in a very important paper on the Avifauna of the Aleutian Islands, from Unalaschka eastward (p. 6), speaks of this bird as a resident and breeding bird of the Aleutian Islands, and more especially of Unalaschka. I cannot help thinking, however, that there is some mistake concerning the identification of the species. It is altogether improbable that this bird, which is known as a breeding bird from very high Arctic latitudes, should rear its young on the eastern Aleutian Islands. If the egg found on the 18th of May, 1872, really belonged to this species, the occurrence can only be regarded as a very anomalous one. I am not aware that later observations corroborate Professor Dall's statement.

During its stay at Bering Island, Steller's Duck is, next to *Clangula glaucion*, the shyest bird of the whole duck tribe. Usually the adult males keep apart from the females and the younger males, and their flocks are almost always farther out at sea than those of the latter.

As to the change of plumage in this species I have only a few remarks to offer. The young males in November had not yet all the new feathers of their first winter plumage fully developed. At the end of April the females were in full moult, while the males were not, and among the many thousands not a single young male was observed at that time to show a trace of a new white plumage.

78. Somateria v-nigra Gray.

1769.—*Anas mollissima* Pallas, Spicil. Zool., V, p. 28 (*nec* Lin.).—*Somateria m.* Taczan., Orn. Faun. Vost. Sibir., p. 71 (*part*) (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 48.—*Id.*, *ibid.*, 1883, p. 398.

1826.—*Somateria cutberti* Pall., Zoogr. Ross. As., II, p. 235 (*part*).

1855.—*Somateria v-nigra* Gray, P. Z. S., 1855, p. 212, pl. cvii.—Dall and Bannist., Tr. Chicag. Acad., I, 1869, p. 300.—Dall, Avif. Aleut. Isl. Unal. westw., p. 7 (1874).—Bean, Pr. U. S. Nat. Mus., 1882, p. 167.—Nelson, Cruise Corwin, p. 101 (1883).—Turnér, Auk, 1885, p. 158.

1856.—*Somateria v-nigrum* Bonap., Compt. Rend., XLIII, 1856, p. 650.—Stejneger, Naturen, 1884, p. 51.

The only adult male I obtained was shot on the 3d of July, being still in its white and elegant breeding dress. But under the white feathers the brown post-nuptial plumage, which is only assumed for a very short time, had already made its appearance, and a few of the dark feathers were so far out as to show themselves between the white ones on the back, although still partly in their sheaths. It would therefore seem as if the Pacific Eider assumes its post-nuptial plumage somewhat later than its Atlantic cousin, of which old males, with the dark plumage almost fully developed, are known from various parts of Scandinavia as early as the latter part of June, notwithstanding that the breeding of the two species takes place at exactly the same time.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Culmen.	Tarsus.	Middle toe with claw.
					mm.	mm.	mm.	mm.	mm.	mm.	mm.
92848	2223	Copper Island......	July 3, 1883	♂ ad.	623	55	304	94	55	52	80
92847	2200	....do..................	June 15, 1883	(♂) ad.	......	......	302	94	49	51	......
92850	2289	... do..................	July 25, 1883	pull.	236	......	......	......	22	28	33

No. 92848.—Iris dark brown. Bill bright and pure orange, deeper brownish-red orange towards the base; lower mandible paler; nail cream-colored. Feet pale brownish orange; joints dusky; webs blackish brown. New (brown) feathers in their sheaths on different parts of the body, on the sides of the rump, shoulder region, and especially neck and head. Weight, 4¼ pounds.

No. 92850.—Iris blackish brown. Bill plumbeous, with an olive tinge; nail horny yellow. Feet very dark yellowish gray; webs blackish. Gullet filled with *Gammaridæ*.

The Pacific Eider is now rather scarce on the Commander Islands. On Copper Island there are only a few places where it at present breeds, in very restricted numbers, namely, at Gladkovskij and at another creek nearer to Karabelnij. From there I got a male in perfect plumage, a female, a downy chick, and an egg. On Bering Island it does not occur at all, except as a rare visitor during the winter. Taczanowski, it is true, asserts (Bull. Soc. Zool. France, 1882, p. 398) that he has received a female and eggs from Bering Island, but this certainly is a mistake, as the bird and eggs, in all probability, are from the place, mentioned above, on Copper Island. I need not mention to anybody familiar with the water birds that his determination of the bird as *S. mollissima* is entirely wrong. This species, of course, does not at all occur in the North Pacific. I repeat that the Eider does not breed now on Bering Island, and has not bred there within the memory of the present inhabitants. The "*Pistrak*" was well known to the Copper-Islanders, who considered it a great delicacy, while only a few of the men on Bering Island had ever seen it. The only one I myself observed, while on Bering Island, was a white male near Zapadnij on the 9th of March, 1883.

The downy young is in every particular a counterpart of the chick of *S. mollissima* of the corresponding age.

The only egg procured (No. 2,210, U. S. Nat. Mus. No. 21,782) measures 70 by 48 millimeters.

79. Oidemia americana Sw. & Rich.

1814.—*Anas nigra* Wilson, Am. Orn. VIII (p. 135, pl. 72) (*nec* Lin.).

1831.—*Oidemia americana* Sw. & Rich., Faun. Bor. Am., II, p. 450.—Dall & Bann., Tr. Chic. Ac. Sc., I, 1869, p. 300.—Finsch, Abh. Brem. Ver., III, 1872, p. 68.—Dall, Avif. Aleut. Isl. Unal. eastw., p. 6, (1873).—Blakist. & Pryer, Ibis, 1878, p. 215.—*Iid.*, T. A. S. J., VIII, 1880, p. 187.—*Iid.*, *ibid.*, X, 1882, p. 100.—Seebohm, Ibis, 1879, p. 23.—Taczanowski, Bull. Soc. Zool. France, 1883, p. 344.—Nelson, Cruise Corwin, p. 102 (1883).—Blakist., Amend. List B. Jap., p. 9 (1884).—Turner, Auk, 1885, p. 158.

During winter this species occurs at the islands, but sparingly, and usually at sea far from the shore. I was therefore unable to procure a specimen, but identified the species beyond question by means of my binocular. The yellow knob at the base of the bill could not be mistaken; it was not *nigra*.

80. Oidemia deglandii Bp.

1814.—*Anas fusca* Wilson, Am. Orn., VIII, (p. 137, pl. 72) (*nec* Lin.).—Kittl., Denkw., I, p. 260 (1858).—*Melanetta f.* Nelson, Cruise Corwin, p. 102.

1850.—*Oidemia deglandii* Bonaparte, Rev. Crit. Degland (p. 108).

1852.—*Oidemia velvetina* Cassin, Tr. Phil. Ac., V, 1850–'51, p. 126.—Finsch, Abh. Brem. Ver., III, 1872, p. 68.—Swinh., Ibis, 1875 p. 457.—Blakist. & Pryer, Tr. As. Soc. Jap., X, 1882, p. 100.—*Melanetta v.* Dall & Bann., Tr. Chic. Ac., I, 1869, p. 300.—Dall, Avif. Aleut. Isl., Unal. eastw., p. 6 (1873).

1863.—*Œdemia americana* Swinhoe, Ibis, 1863, p. 435 (*nec* Sw. & Rich.).—*Id.*, P. Z. S., 1871, p. 419.

The systematic name by which this species is most commonly known is *Oidemia* (or *Melanetta*) *velvetina* Cassin, "1850." Bonaparte's *O. deglandii* was published the same year, and ornithologists deciding the priority by the number of the page must accept the latter name. But other authors will also be compelled to accept it, as Cassin's name was not published before 1851, for his paper was first read before the Academy of Sciences at Philadelphia on December the 24th, and on the last day of that year the committee reported in favor of its publication in the Proceedings (*cf.* Phil. Ac. Sc. Proc., V, 1850–'51, pp. 123 and 126), consequently, the publication can not have taken place in 1850, and may not have been effected before 1852, since the title page of the fifth volume is dated from the latter year.

The only bird obtained by me was a young male of the year, closely agreeing in every respect with a specimen from Shanghai in the U. S. National Museum, and both have the only reliable character by which young and females of this species, *O. deglandii*, can be distinguished from those of the true *O. fusca*, viz, the shorter distance between the lateral feathering of the lores and the nostrils, it being 5^{mm} or less in the former against 6^{mm} or more in the latter. Through the courtesy of Governor Grebnitski, I received this year two old males in splendid plumage, obtained at Bering Island in March and April, 1884, showing the distinctive characters of *O. deglandii* in their greatest development. The distance alluded to above is quite within the given limit; the lateral swelling of the naked part of the maxilla beneath and behind the nostrils, so noticeable in *fusca*, is here absent, and the knob shows a development which may be regarded as excessive even in *O. deglandii*, so much so that it is protracted anteriorly into a kind of a horn overhanging the culmen. In fact, the National Museum, which possesses quite a series of this species, has no specimen which, in that respect, can even be said to approach the two Bering Island birds, which are entirely alike.

The regular occurrence of *O. deglandii* on the Pacific coasts of the Old World may thus be regarded as established beyond the slightest doubt. There seems, however, to be good reasons for also admitting the true *fusca* as an inhabitant of the eastern shores of Asia, the probability then being that the latter occurs more to the northward and along the western shore of the Okotsk Sea to China, while *O. deglandii* reaches from Alaska across the Aleutian chain to Kamtschatka, the Kuriles, and Japan, where it winters and meets *O. fusca* proper, sometimes even traveling as far as China, while, on the other hand, a stray individual of *fusca* occasionally finds its way to Alaska.

The East Asiatic bird has universally and indiscriminately been registered as *O. fusca*. Just how many of these references really belong to it and how many to *deglandii* is difficult to say. I have, therefore, given the chief quotations in the foot-note.*

List of specimens.

U. S. Nat. Mus. No.	Collector's No.	Locality.	Date.	Sex and age.	Wing.	Tail.	Culmen.	From hind border of nostrils to loral feathering.	Tarsus.	Middle toe with claw.
92,847	1692	Bering Island..........	Oct. 23, 1882	♂ juv.	237	68	39	....	47	72
101,205	G. 78	......do	March, 1884	(♂) ad.	275	90	46	5	47	76
101,206	G. 79	......do	April, 1884	(♂) ad.	......	80	44	4.5	46	78

No. 92847.—Iris dark brown. Bill blackish gray. Feet reddish gray; tarsus behind and joints more grayish; webs more blackish. In stomach only small stones.

The "*Turpan*" is not a common winter visitor to the islands, it being mostly seen in fall and spring, and then mostly too far from the shore to be easily secured.

81. Merganser merganser (LIN.).

1758.—*Mergus merganser* Lin., Syst. Nat., 10 ed., I, p. 129.—PALL., Zoogr. Ross. Asiat., II, p. 286 (1826).—TEMM. and SCHLEG., Faun. Jap. Av. (p. —) (1849).—MIDDEND., Sibir. Reise, II, 2, p. 238 (1853).—KITTL., Denkw., II, p. 248 (1858).—SCHRENCK, Reis. Amurl., I, p. 485 (1860).—SWINH., Ibis, 1861, p. 344.—*Id.*, P. Z. S., 1863, p. 323.—RADDE, Reis. Süd. Ost-Sibir., II (p. 378) (1863).—PRZEW., Putesch. Ussur. (n. 212) (1870).—TACZAN., J. f. Orn., 1873, p. 110.—*Id.*, Orn. Faun. Vost. Sibir., p. 72 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 48.—*Id.*, *ibid.*, 1883, p. 345.

1766.—*Mergus castor* LIN., Syst. Nat., 12 ed., I, p. 209.—SWINH, P. Z. S., 1871, p. 416.—*Id.*, Ibis, 1875, p. 456.—BLAKIST. & PRYER, Ibis, 1878, p. 215.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 187.—*Iid.*, *ibid.*, X, 1881, p. 101.—BLAKIST., Amend. List B. Jap., p. 9 (1884).

The Goosander from Kamtschatka and Bering Island, the "*Bolschoj Krachal*" of the inhabitants, is the true *merganser*, indistinguishable from the bird occurring in the western portion of the Palæarctic region.

**Anas fusca* LIN., Syst. Nat., 10 ed., I, p. 123 (1758.)—*Oidemia f.* SWINH., P. Z. S., 1863, p, 324.—*Id.*, *ibid.*, 1871, p, 419.—*Id.*, Ibis, 1875, p. 457.—WHITELY, Ibis, 1867, p. 208.—FINSCH, Abh. Brem. Ver., III, 1872, p. 69.—TACZAN., J. f. Orn., 1873, p. 110.—*Id.*, Orn. Faun. Vost. Sibir., p. 71 (1877).—*Id.*, Bull. Soc. Zool., 1877, p. 48.—BLAKIST. & PRYER, Ibis, 1878, p. 215.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 187.—*Iid.*, *ibid.*, X, 1882, p. 100.—BLAKIST., Chrysanth., 1883, p. 27.—*Id.*, Amend. List B. Jap., p. 9 (1884).—*Anas carbo* PALLAS, Zoogr. Ross. As., II, p. 244 (1826).—MIDDEND., Sibir. Reise, II, 2 (p. 236) (1853).—RADDE, Reis. Süd. Ost-Sibir, II (p. 373) (1863).

From the American form, the occurrence of which on the mainland of Alaska along the Bering Sea has not yet been reported,* it differs not only in lacking the black stripe dividing the white wing-speculum, but the border line of the feathering on the bill is so differently arranged in the two forms, and so constant, that the appellation of *Merganser merganser americanus* is not defensible.

In order to make these differences better understood, I tabulate them as follows:

Merganser americanus.	*Merganser merganser.*
(1) The distance from the loral apex to the angle of mouth is equal to *half* the distance from the loral apex to the posterior corner of the nostrils;	(1) The distance from the loral apex to the angle of mouth is equal to or longer than the *whole* distance from the loral apex to the posterior corner of the nostrils;
(2) The distance from the loral apex to the *posterior* corner of the nostrils is	(2) The distance from the loral apex to the *posterior* corner of the nostrils is
(*a*) about equal to half the distance from the *anterior* corner of the nostrils to the tip of the bill,	(*a*) about equal to one-third the distance from the *anterior* corner of the nostrils to the tip of the bill,
(*b*) and considerably longer than the distance from the loral apex to the tip of the naked frontal angle;	(*b*) and shorter or equal to the distance from the loral apex to the tip of the naked frontal angle;
(3) The distance from the frontal apex to the posterior corner of the nostrils is shorter than the distance from the loral apex to the same point.	(3) The distance from the frontal apex to the posterior corner of the nostrils is equal to the distance from the loral apex to the same point.
(4) Wing-speculum white, divided by a transverse black bar.	(4) Wing-speculum white, undivided.

This species is rather common in Kamtschatka, but being more an inland bird than *M. serrator* it occurs on Bering Island in limited numbers only.

In 1883 the first new-comers—the species does not winter on the islands—were observed on April 15.

A male (*U. S. Nat. Mus. No.* 92872; *L. Stejneger No.* 2027) shot on Bering Island, May 17, 1883, measures as follows: Total length (654)$^{\mathrm{mm}}$. Wing, 297$^{\mathrm{mm}}$; tail-feathers, 110$^{\mathrm{mm}}$; culmen, 55$^{\mathrm{mm}}$; tarsus, 52$^{\mathrm{mm}}$. Middle toe with claw.

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* It has been obtained at Alexandrovsk, Kenay (Finsch); Ft. Yukon, Sitka, Unalaschka (Dall); Kodiak (Bean); Chilcoot (Hartlaub).

83. Merganser serrator (Lin.).

1758.—*Mergus serrator* Lin., Syst. Nat., 10 ed., I, p. 129.—Pall., Zoogr. Ross. As., I, p. 286 (1826).—Middend., Sibir. Reis., II, 2, (p. 238) (1853).—Schrenck, Reis. Amurl., I, p. 486 (1860).—Blakist., Ibis, 1862, p. 332.—*Id.*, Amend. List B. Jap., p. 10 (1884).—Radde, Reis., Süd. Ost-Sibir., I (p. 379) (1863).—Swinh., P. Z. S., 1863, p. 323.—*Id.*, *ibid.*, 1871, p. 416.—*Id.*, Ibis, 1875, p. 456.—Dybow. & Parvex, J. f. Orn., 1868, p. 339.—Baird, Tr. Chic. Acad., I, 1869, (p. 814).—Dall & Bannist., Tr. Chic. Acad., I, 1869, p 301.—Przew., Puteseh. Ussur. (n. 213) (1870).—Finsch, Abh. Brem. Ver., III, 1872, p. 72.—Taczan., J. f. Orn., 1873, p. 111.—*Id.*, *ibid.*, 1874, p. 337.—*Id.*, Orn. Faun. Vost. Sibir., p. 72 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 49.—*Id.*, *ibid.*, 1883, p. 345.—Dall, Avif. Aleut. Isl. west Unal., p. 7 (1874).—Blakist & Pryer, Ibis, 1878, p. 216.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 187.—*Iid.*, *ibid.*, X, 1882, p. 101.—Hartlaub, J. f. Orn., 1883, p. 283.—Nelson, Cruise Corwin, p. 103 (1883).—*Merganser s.* Turner, Auk, 1885, p. 158.

1761.—*Mergus serratus* Lin., Faun. Suec., 2 ed., p. 48.—Swinh., Ibis, 1860, p. 67.—*Id.*, *ibid.*, 1861, p. 344.

This is the "*Krakhal*" of the inhabitants. It is a very common breeding bird on Bering Island, rearing its young on all suitable lakes and rivers. A few stay over all winter. On Copper Island it is rare, for want of suitable localities. It breeds, however, in a few places, thus, for instance, in Pestschanij Valley, near the village.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Culmen.	Tarsus.	Middle toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89103	1127	Bering Island	May 30, 1882	♂ ad..	568	245	77	58	52	65
92873	1478	......do	June 20, 1882	(♂) ad	......	250	80	62	45	67
92874	1479	......do	June 20, 1882	(♀) ad	......	223	73	51	39	59
89104	1421	......do	Aug. 12, 1882	pull...	185	......	.....	19	21	27

No. 89103.—Iris consists of two differently colored rings, the outer fiery red, the inner more brownish. Upper mandible, blackish brown, reddish toward base and edges; lower mandible, blood red. Inner aspect of legs, deep orange-red; joints, shaded with brown; outside and below, reddish brown; webs, brownish livid.

No. 89104.—Inner ring of iris, darker; outer one, lighter gray. Bill, grayish brown; nail, lighter. Feet, light brownish gray; webs, a little darker, and yellowish along the toes.

83. Mergus albellus Lin.

1758.—*Mergus albellus* Lin., Syst. Nat., 10 ed., I, p. 129.—Pall., Zoogr. Ross. As., II, p. 289.—Temm. and Schleg., Faun. Jap. Av. (p. —) (1849).—Middend., Sibir. Reis., II, 2 (p. 238) (1853).—Schrenck, Reis. Amurl., I, p. 486 (1860).—Swinh., Ibis., 1861, p. 344.—*Id.*, P. Z. S., 1863, p. 322.—Radde, Reis. Süd. Ost-Sibir., II (p. 379) (1863).—Dybow. and Parvex, J. f. Orn., 1868, p. 339.—

Przew., Putesch. Ussur. (n. 214) (1870).—Taczan., J. f. Orn., 1874, p. 337.—*Id.*, Orn. Faun. Vost. Sibir., p.72 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 49.—*Id.*, *ibid.*, 1883, p. 345.—Seeb., Ibis, 1879, p. 23.—*Mergellus a.* Swinh., P. Z. S., 1871, p. 416.—Taczan., J. f. Orn., 1873, p. 111.—Blakist. & Pryer, Ibis, 1878, p. 215.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 187.—*Iid.*, *ibid.*, X, 1882, p. 101.—Blakist., Amend. List B. Jap., p. 9 (1884).

The Smew is only a visitor to Bering Island during the spring migration, but is not a regular one. A pair was shot there during the abnormal spring of 1883, abnormal, at least, as far as ornithology is concerned. Another pair was sent me this year by Governor Grebnitski, and a remark on one of the labels indicates that the Smew was rather numerous during the spring of 1884.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Culmen.	Tarsus.	Mid. toe with claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92875	2028	Bering Island	May 20, 1883.	(♂) ad.	(494)	190	74	29	32	55
101213	G. 85	......do	May 8, 1884.	(♂) ad.	......	187	78	30	34	56
92876	2029	.....do	May 20, 1883	(♀) ad.	(390)	177	71	26	32	50
101212	G. 83	......do	May, —1884	(♀) ad.	.....	172	67	27	30	48

ORDER STEGANOPODES.

Superfamily PHALACROCORACOIDEÆ.

FAMILY PHALACROCORACIDÆ.

84. Phalacrocorax perspicillatus PALL.

1826.—*Phalacrocorax perspicillatus* PALL., Zoogr. Ross. As., II, p. 305.—GOULD, Zool. Sulphur, p. 49, pl. xxxii (1844).—TACZAN., Orn. Faun. Vost. Sibir., p. 66 (1877).—*Id.*, Bull. Soc. Zool. France, 1877, p. 41.—STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 65.

1850.—*Graculus urile* REICHENB., Natat. Novit., pl xvii, figs. 2311 and 2312 (*nec* GMEL.) (Cf. BONAP., Consp. Av., I, p. 168, and A. B. MEYER, Index Reichenb., p. 44; no name on the plate!)

When Steller was wrecked on Bering Island in 1741 he found this species very numerous.*

It has now been totally exterminated on the island, and I have nothing to add to what I have said in my preliminary report concerning this species (Pr. U. S. Nat. Mus., 1883, p. 65): "It is not to be doubted that the *Phalacrocorax perspicillatus* does not occur on the islands at present. The natives, however, remember very well the time when it was plentiful on the rocks, especially on the outlying islet Aij Kamen. About thirty years ago, they say, the last ones were seen, and the reason they give why this bird has become exterminated is that it was killed in great numbers for food. They unanimously assert that it has not been seen since, and they only laughed when I offered a very high reward for a specimen."

If the stupidity of the bird has caused its extermination on Bering Island within a hundred years of its discovery—being in every respect a fitting analogue to the history of the extermination of the great northern Sea cow (*Rytina gigas*)—very little probability exists that it should have escaped the fate of this sluggish mammal. There is a bare possibility that it may still be found on some uninhabited, never or seldom visited, rock or island of the Aleutian chain, but it is altogether improbable that it should have escaped detection by such energetic and successful travelers as Prof. W. H. Dall, Mr. L. M. Turner, and the other gentlemen who have collected in that region.

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* Hanc speciem *Stellerus* nusquam nisi in Beringii infausta insula, ubi naufragus vixit, observaverat. Copiosissimi ibi sunt, nunquam tamen Camtschatcæ littora adeunt. Uti magnitudine, ita et stolitate congeneres superant, quumque carne sua tres facile famelicos una impleat, magno naufragis solatio fuere. (Pall., Zoogr., l. c.)

I myself have no doubt that we have to register the Spectacled or Pallas's Cormorant in the same category as the Great Auk (*Plautus impennis*) and the Labrador Duck (*Camptolaimus labradorius*), to which, before long, several other species will have to be added.

85. Phalacrocorax urile (GMEL.).

1788.—*Pelecanus urile* GMEL., Syst. Nat., I, p. 575.—*Carbo* (*Pelecanus*) *urile* KITTL., Isis 1832, p. 1104.

1788.—? ? *Pelecanus violaceus* GMEL., Syst. Nat., p. 575 (*nec* LAWR., 1858).—*Phalacrocorax v.* TACZAN., Bull. Soc. Zool. France, 1883, p. 341.

1826.—*Phalacrocorax bicristatus* PALL., Zoogr. Ross. As., II, p. 301 (*nec* TEMM. & SCHLEG., qui *pelagicus*).—KITTL., Denkw., II, p. 224 (1858).—*Id.*, J. f. Orn., 1858, p. 389.—SWINH., Ibis, 1874, p. 164.—BLAKIST. and PRYER, Tr. As. Soc. Jap., X, 1882, p. 102.—NELSON, Cruise Corwin, p. 103 (1883).—BLAKIST., Amend. List B. Jap., p. 10 (1884).—*Graculus b.* BAIRD, Tr. Chic. Acad., I, 1869 (p. 321, pl. 33).—DALL & BANNIST., Tr. Chic. Acad., I., 1869, p. 302.—FINSCH, Abh. Brem. Ver., III, 1872, p. 86.—DALL, Avif. Aleut. Isl. west Unal., p. 7 (1874).—COUES, in Elliott's Affairs Alaska, p. 192 (1875).

1860.—*Carbo pelagicus* COINDE, Rev. Mag. Zool., 1860, p. 401.

The name of the present species has been involved in great uncertainty and confusion. Some authors have called it *Ph. violaceus* (GMEL.), a name which, by the American ornithologists, almost unanimously has been referred to what Pallas called *Ph. pelagicus*. The latter have mostly used the appellation *bicristatus* PALL., which, on the other hand, by the authors of Fauna Japonica and many of their followers has been misapplied to *pelagicus*, while *urile* GMEL. was doubtfully referred to the present species or to *perspicillatus* PALLAS, or to both.

This uncertainty as to the proper location of Gmelin's *urile* has arisen from a slip of the pen on the side of the author of the "Arctic Zoology," which, like many other elephants, was swallowed whole by Gmelin.

Gmelin's *Pelecanus urile* is based entirely and solely upon the "Red-faced Corvorant, *Arct. Zool.*, 2, p. 584, C.; Red-faced Shag, *Lath. syn.*, III, 2, p. 601, n. 17; urile, *Steller Camtschatc.*, p. 157," the latter quotation evidently being referable to James Grieve's English edition of Kraschenninikoff's "The History of Kamtschatka" (Gloucester, 1764). In the diagnosis he says: "*gutture et orbitis albis, facie nuda et cærulescente rubra,*" which, as compared with Pallas's diagnosis of *Ph. per-*

spicillatus (Zoogr. Ross. As., II, p. 305) "*facie nuda rubro cæruleescentique varia, circulo cutaneo oculos ambiente albo,*" has caused the belief that *urile*, at least partially, was referable to *perspicillatus.*

If we now turn to the "Arctic Zoology," p. 584, we find the following:

"C. RED-FACED CORVORANT. Ouril of the Kamtschatkans, *Descr. de la Kamtschatka*, 493.—*Latham*, iii.

"*P.* With a slender bill; upper mandible black; lower red: from the bill to the eyes is a space covered with a bluish red, naked skin: round each eye a white cutaneous circle: * * * on the fore part of the neck a few white slender feathers; * * * tail consisting of twelve feathers only. * * * LENGTH of one I measured thirty-one inches. *Steller* compares its size to that of a goose.

"Inhabits the high precipices on the coasts of *Kamtschatka.*"

We then proceed to the French edition of Kraschenninikoff's "Description du Kamtschatka" (Paris, 1763), the one cited by Pennant, from which we quote as follows (p. 493): "L'Ouril est de la grosseur d'une Oie ordinaire: * * * Il a aussi sur le cou, par places, de longues plumes blanches & minces comme des cheveux. Les yeux sont entourés d'une petite membrane rouge, comme dans les Coqs de bois. * * *"

From the above it seems unquestionable that Pennant's, "a white cutaneous circle," is only a slip of the pen for "a red cutaneous circle" (entourés d'une petite membrane rouge), a conjecture we shall find confirmed if looking still closer into the matter. It may be well, however, to remark here that it also is evident that Pennant had a specimen which he had measured, and from which he took the characters "bill slender," and "tail consisting of twelve feathers."

Next comes Latham's description. (Synops., III, pt. 2, p. 601. London, 1785—same year as the Arctic Zoology.)

"Red-faced Corvorant, *Arct. Zool.*, p. 584, c. Urile, *Hist. Kamtsch.*, p. 157. 17.

"This is somewhat less than the *Corvorant:* Length two feet ten inches [34 inches]. Bill three inches and a half long; the base of a reddish green, the end black: round the eye a bare skin of a reddish colour: * * * on the middle of the neck before a few slender white narrow feathers thinly interspersed among the others, many of them two inches and a half in length: * * * tail six inches in length, consisting of twelve feathers. * * *

"Inhabits *Kamtschatka.*"

From his reference, the English edition of the "History of Kamtschatka," p. 157, we only quote: "The fowl urile, of which there is great plenty in *Kamtschatka*, * * * has a red membrane or skin round the eyes," this latter expression being evidently the translation of Steller's "periophtalmiis cinnabarinis," as given in a foot-note.

It is plain from the above that Latham also had a specimen before him, and I think there can be little doubt that it was the same as described and measured by Pennant,* the description of which agrees in every particular with the bird afterward described by Pallas as *bicristatus*.

We have now concluded (1) that the "Ouril" and "Urile" of the "Description of Kamtschatka" is the *bicristatus;* (2) that Pennant's and Latham's "Red-faced Corvorant or Shag" was based upon the above partly, and partly upon a specimen belonging to that very species; (3) that the character given by Pennant as "a white cutaneous circle" was only a slip of the pen; (4) that the name *urile*, given by Gmelin, and also the erroneous diagnosis, are based on the above; in other words, that *urile* is the older name for *bicristatus*, and that *urile* is not a synonym of *perspicillatus*, not even in part. The latter conclusion is also apparent by a comparison of the characters given, except the white (!) eye-ring.

Urile is said to have the bill slender; in *perspicillatus* it is robust. *Urile* has 12 rectrices only, while *perspicillatus* is said to have 14. The former is given as having white slender feathers on the fore part of the neck only, while the characteristic feature of the latter is the long and straw-yellow feathers on the head and neck.

There remains now only to dispose of the name *violaceus* GMEL., which is absolutely of the same date as *urile*, occurring on the same page.

In this case, too, Gmelin bases his name and diagnoses upon the same two works as above; his diagnosis, "P. niger violaceo-nitens, capite cristato." "*Habitat circa* Camtschatcam, *vicinasque insulas*," being a literal translation of the whole text of Pennant relating to the species, viz: "P. With the body wholly black, glossed with violet color. Found about *Kamtschatka* and the isles." Latham does not add anything, except the remark, "the size not mentioned."

It will be seen that it is impossible to determine the bird from the above description, so we may safely do away with a name which has caused so much confusion, being fortunate enough in having a name of the same date and of indisputable pertinency.

Mr. Taczanowski, in a recent memoir (Bull. Soc. Zool. France, 1883, p. 341) says: "Les deux espèces voisines des mers de Kamtschatka, sont si distinctes entre elles et si bien caractérisées par Pallas, qu'il est étonnant qu'elles soient confondues par plusieurs ornithologistes modernes." Schlegel (Mus. P. B., l. c.) cannot be said to have confounded them, as he quotes neither *Ph. pelagicus* PALL. nor *Ph. bicristatus* PALL. among the synonyms of his *Ph. violaceus*. Swinhoe, in 1874 (Ibis, p. 164), clearly pointed out the difference between the two forms, and was followed by all later writers on Japanese ornithology. Professor Baird, in 1869 (Tr. Chicag. Acad., I, 1869, p. 321), correctly kept the two species separate, retaining for the one Pallas's name *bicristatus*, while applying Gmelin's name *violaceus* to *pelagicus* PALL., and herein he has been followed by all later American authors without exception. The only modern ornithologist, of any consequence, who has confounded the two species is evidently Mr. Taczanowski himself, quoting, as he has done, *pelagicus* PALL. as a synonym of *bicristatus* PALL. (see Bull. Soc. Zool. France, 1877, p. 41).

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* The difference in the length—31 and 34 inches—is hardly of any account, if we remember that the measurements are taken from a mounted specimen.

Mr. Taczanowski then proceeds to give a comparative table of the distinctive characters of the breeding males of the two species; but, although generally correct, he falls into some errors in describing the colors of the naked parts. In *urile* (=*bicristatus*) the naked skin of the face is not "d'un rouge minium," but bright reddish orange, while the "peau nue sur la naissance de la mandibule inférieure, au bord de la mâchoire, et de la gorge," is not "noirâtre," but beautiful blue. The difference in color of the naked parts is truthfully represented in the colored drawings, pl. viii, figs. 1 and 2, made by me from the fresh specimens less than an hour after they were killed. The drawings also represent the difference in the coloration of the iris in the two species.

It is not only in the coloration of the naked parts of the faces that the two species differ. They are easily told apart by structural differences in almost all ages, and even the downy young and the eggs are easily distinguishable.

But before proceeding to a detailed comparison, I want to call attention to the measurements of the two forms, as given in the paper of Mr. Taczanowski (*op. c.*, p. 343). In the first place, the measurements of the "longueur totale" and the "vol" are transposed; this typographical error is obvious and easily disposed of. Looking at Taczanowski's table we find, however, that the measurements given show *pelagicus* to be a larger bird than *urile* (*bicristatus*). But so is not the actual fact, as *urile* decidedly is the larger one of the two. An inspection of the measurements given by me under the headings of the two species will prove that such is the case.* I may add that the dimensions accompanying Pallas's description of *bicristatus* and *pelagicus* likewise show the former to be the larger species. The opposite result of Taczanowski's table can only be accounted for by supposing that the measurements of the two species have been transposed in the same manner as those of the total length and the stretch of the wings.

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* The weight of an adult *urile* (No. 92877) was 5 pounds, while an adult specimen of *pelagicus* at the same time only weighed 2 pounds 5 ounces.

Nobody, however, who has ever seen the adults of both species when fresh, or nearly so, mistook them for being the same species. The difficulty has arisen from the young plumage, in which both species are very much like each other. In the adult of the present species the feathering of the forehead does not reach the base of the bill, thus rendering it very easily separable from *Ph. pelagicus;* but in the young *urile* (=*bicristatus*) the forehead is as fully feathered as in *pelagicus.* Nevertheless, it is the outline of the feathering at the base of the bill which will furnish us with the best character, as in the young *pelagicus* it forms a well-pronounced malar apex below the angle of the mouth, while in *urile* it runs down in nearly a straight line without forming so conspicuous an apex.

A difference in the wing formula, as supposed by Mr. Swinhoe, cannot be verified in a large series, there being hardly two individuals of exactly the same relation between the primaries.

But also the young in the nest are rather easily distinguished even before they have got any feathers. I give the following remarks as I wrote them, with the downy young of both species, just taken out of their nests, before me:

In *urile* the limit between the whitish color of the gular portion and the lead-colored skin of the remaining portion of the body is very distinctly defined,	while in *pelagicus* this limit is much more irregular and has a quite different outline.
The dusky down of *urile* is tipped with brownish gray,	the down in *pelagicus* being uniform black, so as to give the whole bird a much darker appearance.
On the outside of the thighs is a large spot dotted with white down,	while white down is altogether missing in *pelagicus.*
Of structural differences, is especially to be mentioned, in *urile* the greater breadth of the bill at base,	compared with the much narrower shape of the bill at base in *pelagicus.*

Even the eggs of the two species cannot be confounded. Not only are those of *urile* considerably larger than those of *pelagicus*, but the green color, when looked at through the shell, is totally different, being much more bluish in the former, against yellowish in the latter.

The difference between the adults will be best understood from the colored drawings (pl. viii, figs. 1 and 2), and no further remarks are thought necessary, except perhaps, that the irides in the adult are totally different colored, being brownish in *urile*, while green in *pelagicus*.

The color of the plumage and its general characters are pretty much the same in both species, except that the purplish bronzy gloss on the scapulars is stronger and more violet in *urile* than in *pelagicus*, and that the latter has a more purplish tinge on the upper neck.

Before leaving the subject I may perhaps mention a structural character which I noted in the fresh birds, viz, that in *urile* the outer—longest—toe is proportionally much longer than in *pelagicus*, its last joint reaching considerably beyond the tip of the nail of the middle toe, while in the latter species the end of the nail just reaches the joint.

I had no opportunities of investigating the changes of plumage and the moult of the present species. The extensive series in the National Museum enables me, however, to state that the changes exactly correspond to those of the following species as examined by me. A detailed account of these observations will be found under the heading of that species.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tall beyond wings.	Wing.	Tail-feathers.	Culmen.	Bill along gape.	Tarsus.
					mm.	mm.	mm.	mm.	mm.	mm.	mm.
92877	2261	Glinka, Copper Island.	July 14, 1883	♂ ad.	791	188	300	171	54	79	62
92878	2287	Saint Mathew, Copper Island.	July 25, 1883	jun.	778	176	296	171	53	77	61
92879	2262	Glinka, Copper Island.	July 14, 1883	pull.	348	......	......	......	......	43	31

No. 92877.—Iris light, of a "raw umber" color. Bill, a upper mandible brownish-black, with a stripe on culmen, flames on the sides, and at base horny, yellowish white, at base, blue; lower mandible horny yellowish; tip blackish; base faint bluish. Forehead, lores, and eye-region, naked and smooth, and bright orange, connected with the rugated wattles which are orange-red and encircle the gular sac by a narrow orange-colored stripe behind the mouth; the soft parts next to the bill all around and the gular sac of a bright blue, tinged with violet, and deepening in color from the forehead down to the gular sac. Feet uniformly brownish black without any kind of spots or mottling. Interior of mouth blue. Not fat. Weight, 5 pounds.

No. 92878.—Iris as in the foregoing specimen. Bill dark horny brown, towards base as also the naked parts of the face light flesh-color, with a faint tinge of bluish on the lower mandible; the eye-ring with an olive tinge. Feet uniformly brownish black; webs lighter, dark brownish, without blotchings. Weight, 4.6 pounds.

No. 92879.—Skin of body whitish next to the lower mandible, violet blackish on the rest of the body, somewhat lighter on the feet, and still more so on the belly and the inside of the tibiæ.

The inhabitants of the islands distinguish the present species as "*Bolschoj Uril*" in contradistinction to the "*Malinkij Uril*," which is

Ph. pelagicus. Being not only the rarer of the two species, but also the most difficult to shoot, no specimen was obtained from Bering Island, where it is only known to breed with certainty on Arij Kamen which also was the last refuge of *Ph. perspicillatus.* On Copper Island it is more numerous, especially towards the southern end of the island, but is by no means common, compared with the number of *Ph. pelagicus* in the same locality.

Three eggs (U. S. Nat. Mus. No. 21765, L. Stejneger No. 2263) were taken from a nest at Peresjejek, Copper Island, on the 14th of July, 1883. All three were perfectly clear, measuring 61 by 40, 63.5 by 39, and 66 by 37^{mm}. Another egg from Bering Island (Mus. No. 21766; L. Stejneger No. 2328) measures 61 by 39^{mm}.

86. Phalacrocorax pelagicus PALL.

1826.—*Phalacrocorax pelagicus* PALL., Zoogr. Ross. As., II, p. 303.—SWINH., Ibis, 1874, p. 164.—*Id.*, *ibid.*, 1877, p. 147.—BLAKIST. & PRYER, Ibis, 1878, p. 216.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 187.—*Iid.*, *ibid.*, X, 1882, p. 102.—TACZAN., Bull. Soc. Zool. France, 1883, p. 341.—TURNER, Auk, 1885, p. 158.

1849.—*Carbo bicristatus* TEMM. & SCHL., Faun. Jap. Av., pl. 84 (*nec* PALL.).—SWINH., Ibis, 1861, p. 410.—*Phalacrocorax b.* SWINH., Ibis, 1861, p. 408.—*Id.*, *ibid.*, 1863, p. 434,—*Id.*, P. Z. S., 1863, p. 325.—WHITELY, Ibis, 1867, p. 211.—BLAKIST. & PRYER, Ibis, 1878, p. 216.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 188.—*Graculus b.* SWINH., P. Z. S., 1871, p. 420.—TACZAN., J. f. Orn., 1876, p. 203.—*Id.*, Bull. Soc. Zool. France, 1877, p. 41.—*Id.*, Orn. Faun. Vost. Sibir., p. 66 (1877).

1867.—*Phalacrocorax æolus* SWINH., Ibis, 1867, p. 395.

1872.—*Graculus violaceus* FINSCH, Abh. Brem. Ver., III, 1872, p. 86 (*nec* GMEL.).—*Phalacrocorax v.* NELSON, Cruise Corwin, p. 103 (*part*) (1883).

1874.—*Graculus bairdii* DALL, Avif. Aleut. Isl. west Unal., p. 8 (*nec* COOPER).

It will be seen that in the above synonymy all American references are left out, except those relating to the occurrence of the species on the Aleutian Chain. A close inspection convinced me that my birds, and also those from the other Aleutian Islands, are distinct from the race occurring on the coasts of the mainland of Alaska, being in fact nearer to the southern race, the so-called *Ph. pelagicus resplendens.* This fact, however, has no bearing upon the name of the Kamtschatkan bird, which certainly is the bird to which Pallas originally gave the name *pelagicus.* It is the Alaskan form which required a new name, and it has, consequently, been named by Mr. Ridgway *Ph. pelagicus robustus.*

I made a few observations regarding the change of plumage in this species which may be of some interest, as this part of the natural history of the Pacific birds seems to have been unduly neglected.

It will be necessary first to remark that these birds raise two broods during the summer. This is not to be understood as a positive statement that the same parents rear two sets of young every year—although I believe that most of them do—but simply that I have found the colonies of this species having eggs and downy young at two different times. The first season commences early in May, the young of this brood being fully fledged in the latter part of July. In the middle of this month, however, the colonies again contained all stages, from fresh eggs to newly-hatched young. During the first days of August I found downy young of almost the same age and still without feathers, while on the 21st of August, 1882, I visited a numerous colony at Poludjonnij, Bering Island, in which the oldest young were about half fledged. These would not be able to fly before the first week of September. Between the two periods, young in all stages of development will be found in the colonies, but proportionately few in number. It will thus be seen that it is safe to assume that the difference in age between the earliest and the latest born young in one year amounts to three months, at least.

We are now prepared to understand that we can find two birds undergoing the corresponding moult at times as much apart as the birthdays of the same two birds. If the first moult occurs, say, ten months after the bird broke the shell, the bird born in the middle of May will moult in the middle of March next year, while the one born in the middle of August will not moult before the middle of June next year. And this conclusion is borne out fully by the observed facts. As will be seen from the details relating to the birds collected by me, as given below, I shot birds in the latter part of February, both younger and older, which were just in the first stage of moulting,* while, on the other hand, I have a skin before me in full moult from young to adult plumage, as late as July, a discrepancy hardly to be accounted for, except by the above explanation.

When about ten months old, the first plumage, which is of the dark grayish sooty color, with some green and purplish reflections in the fresh plumage, changes into the resplendent garb of the adult,† from which it then is undistinguishable, except by not having the bright colors of the naked parts of the face and by lacking the white feathers on the neck and thighs. In the following spring, or when about twenty-three months old, it begins to breed.

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*In fact, I should not have been able to ascertain the fact had it not been that I always was on the lookout for the moult when skinning the fresh bird, and making my notes right on the spot.

†Mr. N. S. Goss in a paper in "The Auk" (1884, p. 164) thinks that the birds (*Ph. pelagicus resplendens*) must be two years at least in acquiring the adult plumage, because many of the young birds were still of a brown color on the 6th of June. The explanation is simply that the greater part had not yet commenced their moult as early as that date.

The white plumes on neck and thighs belonging to the breeding plumage are generally assumed during the early part of the winter; still, many of them were undeveloped in a female shot on the 26th of April, 1883. These white feathers do not exclusively belong to the adult plumage, as a young female, shot in February, has the thighs of the sooty plumage broadly streaked with white feathers, which are not dense enough, however, to form a continuous patch. Even in the young, only a few days old, the down on the thighs is distinctly white, in strong contrast to the brownish color of the down on the rest of the body. The ornamental white plumes disappear in the course of summer, when the breeding process is over, at which time also the gradual moult of the wing and tail-feathers commences.

During winter the color of the naked parts in the young changes from an ashy flesh-color to a dark grayish brown, while at that time the adults have the caruncles of a dull brownish orange, which color, towards the breeding season, changes into a deep vermilion, while the skin between the caruncles remains dark grayish brown. Mr. Taczanowski says[*] that the red caruncles disappear after the breeding season, and that the naked sides of the face are then covered more or less with feathers. This is, however, not the case, his mistake evidently being caused by having before him young birds in their second plumage, say between thirteen and twenty months old.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Culmen.	Bill along gape.	Tarsus.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89120	1169	Bering Island	June 8, 1882	♂ ad.	726	......	270	132	49	75	53
89119	1168	....do	June 8, 1882	♀ ad.	706	......	261	144	45	62	49
92881	1927	....do................	Feb. 21, 1883	♀ ad.	714	140	260	142	48	69	58
92883	2005	....do	Apr. 26, 1883	♀ ad.	678	146	......	......	......	..	......
92882	1926	...do................	Feb. 21, 1883	♀ juv.	672	133	243	135	44	67	50
92880	2265	Copper Island.......	July 14, 1883	pull.	377	......	......	......	......	42	30

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[*] *Tom. cit.*, p. 342.

No. 89120.—Iris yellowish green. Bill horny blackish brown, lighter at base; caruncles along border of bill, on the lores, around the eyes, and on the chin-angle brownish vermilion. Feet jet black.

No. 89119.—Colors exactly like foregoing.

No. 92881.—Bill blackish brown; lower mandible and especially the tomia lighter; naked parts of face dark grayish brown with brownish orange warts. Feet black. Nail of outer toe fells 23^{mm} short of tip of tail, legs being stretched backwards. New feathers in their sheaths, but still concealed under the old ones, all over the back, nape, and head. None of the white plumules in the sheaths. Very fat.

No. 2005.—Iris deep sea-green. Naked skin of face dark grayish brown with brownish vermilion papillæ. Feet black. Backwards stretched toes reach tip of tail; tip of closed wings hardly reach the heel-joint, nor do they reach the tips of upper tail coverts, the distance being 21^{mm}. All the white plumules are new, those on neck and head still partly or wholly in their sheaths. Largest eggs in ovary of the size of small peas. Extremely fat.

No. 92882.—Bill horny blackish brown, lighter along tomia; naked parts of face dark grayish brown. Feet black. New tertials and feathers on the crown of the head in their sheaths. The white plumules on the thighs show no traces of being new. Nail of outer toe fells 10^{mm} short of tip of tail, legs being stretched backwards.

No. 92880.—Colors of naked skin exactly as in the downy young of *Ph. urile*, No. 92879.

The Pelagic Cormorant is a very abundant resident of both islands, breeding on all the most rugged and steepest promontories which rise immediately from the sea, as well as on the outlying islets and stones. Many of them winter around the coast, but they are not by far so common at that season as during summer.

Although very plentiful at the present date, their number is said to have been vastly greater before 1876, when their endless myriads in some places were real "landmarks," which could be relied upon even in foggy weather, such a point, for instance, being the northern cape of Copper Island, as Captain Sandman informed me. But during the winter of 1876–'77 thousands and thousands were destroyed by an apparently epidemic disease, and masses of the dead birds covered the beach all round the islands. During the following summer comparatively few were seen, but of later years their number has again been increasing, though people having seen their former multitude think that there is no comparison between the past and the present. From Bering Island the reports are similar, with the addition that the stone-foxes would not eat the corpses. As the "*Uril*" forms a not inconsiderable part of the fresh food of the natives during the time of the year when the fur-seal (*Callorhinus ursinus*) is not slaughtered, especially now when "*Nerpi*" (*Phoca vitulina*) are getting scarce, the people were very much afraid that these birds might be totally exterminated, like *Phalacrocorax perspicillatus*.

The eggs measure as follows:

U. S. Nat. Mus. No.	L. Stejneger No.	Locality.	Date.	Diameters.
				Millimeters.
21763	1170	Bering Island	June 8, 1882	56 by 37.5
				56.5 by 37.5
				53 by 37
				59 by 37
21764	2264	Copper Island	July 14, 1883	59 by 34.75
				58 by 35

Of the latter set one egg was perfectly clear, the second contained a very small embryo, while the third one, which was broken, contained a somewhat larger fœtus.

ORDER RASORES.

Superfamily TETRAONOIDEÆ.

Family TETRAONIDÆ.

87. Urogallus parvirostris kamtschaticus (KITTL.).

1858.—*Tetrao kamtschaticus* KITTLITZ, Denkw. Reis., II, p. 354, fig. on p. 353.
1870.—*Tetrao parvirostris* GRAY, Handl. B., II, p. 276 (*nec* BP.).
1883.—*Tetrao camtschaticus* TACZANOWSKI, Bull. Soc. Zool. France, 1883, p. 333.[*]
1884.—*Tetrao urogalloides* BOGDANOW, Consp. Av. Imp. Ross., I, p. 24 (*part*).

The Kamtschatkan Capercalzie has been shown by Mr. Taczanowski to be distinct from the bird called by Middendorf *T. urogalloides*[†], and I have only little to remark in addition to his very full and accurate descriptions (Bull. Soc. Zool. France, 1883, pp. 333–338). It is evident, however, that he lays too much stress on the difference in the graduation of the tail in the two forms, since my specimen is exactly intermediate, and hence I conclude that the two forms are not more than subspecifically distinct.[‡]

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[*] Taczanowski quotes erroneously "Kittliz, Reis. Russ. Amer., I, p. 314;" the correct citation is as given above.

[†] It is strange that many authors still persist in using this name after it has been shown that Prof. Sven Nilsson, long before Middendorff, applied *urogalloides* to the hybrid between the Black Cock and the Capercalzie so common in Scandinavia. Whether applied to a hybrid or not, the name is preoccupied, and Bonaparte's substitute, *parvirostris*, should be adopted without delay. Its synonymy is as follows:

Urogallus parvirostris (BP.).

1826.—*Tetrao urogallus* PALL., Zoogr. Ross. As., II, p. 56 (*part*).
1853.—*Tetrao urogalloides* MIDD., Sibir. Reise, II, 2 (p. 195, tab. xviii) (*nec* NILSS.).—SCHRENCK, Reise Amurl., I, p. 396 (1860).—RADDE, Reise Süd. Ost-Sibir. II (p. 299) (1863).—ELLIOT, Monogr. Tetr., pl. vi (1865).—DYB. & PARV., J. f. Orn., 1868, p. 336.—TACZAN., J. f. Orn., 1873, p. 98.—*Id.*, Bull. Soc. Zool. France, 1876, p. 242.—*Id.*, Orn. Fauna Voèt. Sibir., p. 47 (1877).—BOGDAN., Consp. Av. Imp. Ross., I, p. 24 (1884).
1856.—*Tetrao parvirostris* BONAP., Compt. Rend., XLII, p. 880.

Pallas in a note (*op. cit.*, p. 58) mentions this species as a smaller variety, which the Russians call "Rock Capercalzie." Upon this has been founded the following altogether unwarranted quotations: "*Tetrao urogallus* var. *minor* Pallas Zoogr. R. A., II, pp. 58, 59" (Elliot, Monogr. Tetraon., text to pl. vi), and "*Tetrao urogallus* var. *rupestris* Pallas, Zoographia Rosso-Asiatica, II, p. 58, Nota 2" (Bogdanow, Consp. Av. Imp. Ross., I, p. 24).

[‡] Of the genus *Urogallus* we then have two well-defined species. It does not seem that *Urogallus urogallus* has been studied closely enough as to its local varie-

The downy chicks of this form, which is rather common on the mainland of Kamtschatka, have not yet been described so far as I know. I was fortunate enough to obtain two, the larger of which may be described as follows:

Pullus (*U. S. Nat. Mus., No.* 92705; *L. Stejneger, No.* 2300. *Petropaulski, Kam., beginning of July,* 1883).

Above pale rusty ochraceous, more or less spotted with blackish; underneath pale buff, more yellowish on jugulum and abdomen, unspotted; the spots on the upper surface are arranged as follows: On the forehead an arrow-shaped blackish spot and a double one on the lores; just on the border between forehead and crown a large horseshoe-shaped spot with the opening turned toward the beak; on the crown a somewhat indistinct cross-streak, and a similar one across the nape; on the ear-coverts two very distinct spots, and behind them, on the side of the neck, a larger rusty brown spot circumscribed by black; along the middle of the hind neck a longitudinal streak; back more or less mottled with dusky, which color on the posterior part of the back forms into two indistinct parallel longitudinal bands of a more rusty hue. The remiges and the larger coverts are out, with more or less regular mottlings of dusky and pale rusty in both webs and broadly margined with rusty cream-color, which also runs up along the shafts; the tips of the light margins of the great coverts are nearly white, so as to form a conspicuous band across the wing. Chin, throat, and tibiæ pale buff, as the rest of the under surface, and without dark markings.

The two specimens are exactly alike in every particular.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Sex and age.	Locality.	Date.	Wing.	Tail-feathers.	Expos. culmen.	From anterior border of nostrils to tip of bill.	Tarsus.	Middle toe with claw.	Graduation of tail.	Distance from upper tail-coverts to tip of tail.	Height of bill.
				1883.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92704	2059	(♂)ad	Petropaulski......	March	375	315	37	24	68	73	100	96	21
92705	2300	pull.	....do..........	July	70	25	9	6	23	23	......	......	......
92706	2301	pull.	....do...............	July	61	12	8	5	21	22	......	......	......

ties. There are apparently at least two forms in Europe (being now without sufficient material, I shall only hint at *Tetrao eremita*, described in "Svenska Vetenskaps Akademiens Handlingar för 1789" (p. 179), which is "smaller than the usual bird, and ashy gray, with somewhat darker head and neck"), and one East Siberian variety which may be called *Urogallus urogallus taczanowskii*. It is described by Mr. Taczanowski thus: "Les mâles obtenus d'Irkutsk se distinguent par plusieurs détails des oiseaux de l'Europe, c'est-à-dire: ils ont les pattes beaucoup plus velues, et les doigts couverts jusqu'à la dernière articulation; ils ont le bec un peu plus court, plus renflé sur les côtés au devant des narines; le plumage en général plus mou avec un dessin généralement plus fin. Les femelles ont les plumes des pattes plus abondantes que dans les femelles européennes, mais la différence n'est pas aussi grande que chez les mâles; leur bec est aussi plus large à la base" (Bull. Soc. Zool. France, 1876, p. 243). The other species is *Urogallus parvirostris* (Bp.) with its two subspecies *U. parvirostris kamtschaticus* (Kittl.), and *Urogallus parvirostris sachalinensis* (Bogdanow) (*Tetrao urogalloidis* var. *β. sachalinensis* Bogdan., Consp. Av. Imp. Ross., I, 1884, p. 122).

88. Lagopus lagopus (Lin.).

1758.—*Tetrao lagopus* Lin., S. N., 10 ed., I, p. 159.—Pall., Zoogr. Ross. As., II, p. 56 (*part*) (1826).

1788.—*Tetrao albus* Gmel., Syst. Nat., I, 2 p. 750.—*Lagopus a.* Midd., Sibir. Reise, II, 2 (p. 190) (1883).—Schrenck, Reise Amurl. I, p. 395 (1860).—Radde, Reisen Süd. Ost-Sibir. (p. 294) (1863).—Baird, Trans. Chic. Acad., I, 1869 (p. 663).—Dall & Bann., *ibid.*, p. 287.—Finsch., Abh. Brem. Ver., III, 1872, p. 62—Taczan., J. f. Orn., 1873, p. 98.—*Id.*, Bull. Soc. Zool. France, 1876, p. 242.—*Id.*, Orn. Faun. Vost. Sibir., p. 47 (1877).—Bean, Pr. U. S. Nat. Mus., 1882, p. 163.—Nelson, Cruise Corwin, p. 80 (1883).—Stejneger, Naturen, 1884, p. 8.—Bogdan., Consp. Av. Ross., I, p. 32 (1884).

1788.—*Tetrao lapponicus* Gmel., Syst. Nat., I, 2, p. 751.

1815.—*Tetrao saliceti* Temm., Gall. et Pig., III, p. 208.—Kittl., Denkw., II, p. 249 (1858).—Adams, Ibis, 1878, p. 436.

1817.—*Tetrao subalpinus* Nilss., Orn. Svec., I, p. 307.—*? Lagopus s.* Nordquist in Nordenskj., Voy. Vega, Amer. ed., p. 433 (1882).

1883.—*Lagopus alpinus* Nelson, Cruise Corwin, p. 82 (*nec* Nilsson).

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*
92707	2042	Petropaulski	May 19, 1883	♂ ad.	417	72	203	120
92708	2048	......do	May 19, 1883	♂ ad.	410	65	200	110

No. 92707.—Iris dark brown. Bill horny blackish, plumbeous. Crop contained buds of willows, catkins of alder, and a hip of *Rosa kamtschatica*.

A few small flocks were met with on a hunting expedition in the neighborhood of Petropaulski on the 19th of May, 1883. They were exceedingly shy, and as the snow was 4 to 6 feet deep on the ground we had to hunt the grouse in sledges drawn by ten dogs, and to shoot from the sledge. A strange way of hunting grouse! Only the males had commenced assuming the dark plumage, the head and neck being already brown, all the brown feathers still partly in their sheaths.

This species does not occur on the islands.

89. Lagopus ridgwayi Stejneger.

1826.—*Tetrao lagopus* Pall., Zoogr. Ross. As., II, p. 63 (*part*).

1883.—*Lagopus albus* Stejneger, Pr. U. S. Nat. Mus., 1883, p. 72 (*nec* Gmel. *cf.* "The Auk," 1884, p. 82).

1883.—*Lagopus alpinus* Dybowski, Bull. Soc. Zool. France, 1883, p. 368.

1884.—*Lagopus ridgwayi* Stejneger, Proc. Biol. Soc. Washingt. I, April 10, 1884, p. 98.—*Id.*, Amer. Naturalist, XVIII, 1884, p. 774.—*Id.*, Zeitschr. Ges. Orn., I, 1884, p. 89 pl. v.—*Id.*, Ibis, 1885, p. 50.

1884.—*Lagopus rupestris* subsp. *insularis* Bogdanow, Consp. Av. Ross, p. 34.

I consider myself excusable in making the mistake of calling this bird *Lagopus albus*, when I wrote my preliminary report on the islands, although it really belongs to the *Attagen* group, so differently colored is it from all other Rock-ptarmigans. Of course, if I had looked closer at the structural characters, such an error could not have happened, but the specimens were not at hand when I wrote my report, and the general color, in connection with the statement of Prof. W. H. Dall (Notes on the Avifauna of the Aleutian Islands, especially those west of Unalashka, 1874, p. 5) that *L. albus* is the only species of grouse found on the Aleutian Islands,* led me to make such a blunder. As soon as I got winter specimens the mistake was plain, but I never dreamed of a new species of ptarmigan before it came to actual comparison of specimens.

It seems from the blackish preæstival plumage of this species, especially the almost uniform blackish præpectus, that it is more nearly allied to *L. muta* than to *L. rupestris*, in spite of its brown color; but it is a perfectly good species and affords a most interesting proof of the palæarctic relationship of the Commander Islands on the one hand, and of their remarkable isolated zoological position on the other. It would almost seem as if the isolation, as a factor in the development of new species or forms, is effective in inverse proportion to the size of the isolated area. The ptarmigans of Europe have been separated from each other on three or four different mountain systems, probably as far back as the end of the Glacial period. Still the difference between *L. mutus* from Scandinavia and *L. mutus vulgaris* from Southern Europe is rather slight. It is at present hardly possible to tell how long a time has elapsed since the Commander Islands have been separated from the mainland; but, even if that took place still earlier, the distinctness of many of the birds appears very remarkable.

Before entering on a more detailed comparison with allied forms, some remarks upon the changes of plumage among these birds may not be out of place.

In my preliminary report (p. 74), I concluded "that no marked seasonal plumage can be distinguished, except the white plumage of the winter and the dark one of the summer," for the reason that these birds are "subject to an uninterrupted change from the moment when the first dark feathers make their appearance in spring until the last one has disappeared in fall." Additional material and subsequent observations force me to modify this statement to the effect that there are two very different summer plumages indeed—one preæstival and one postæstival, which, however, on account of the uninterrupted change during the whole summer, are, during the middle part of the season, so blended and mixed together as to justify the expression that there is no marked limit between them. As to my failure in recognizing a third summer plumage I refer here to some remarks further below.

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* It now turns out that the species inhabiting the American islands of the Aleutian Chain belong to two different races, *L. rupestris nelsoni* STEJN., and *L. rupestris atkhensis* (TURNER), and that *alba* does not occur at all on the islands. It is first on the Shumagin Islands that *alba* is found. I have myself examined a ♀ in breeding plumage obtained by Dr. T. Bean on Unga.

The first dark feathers of the summer plumage of the male make their appearance on the upper part of the head about the beginning of May. Still, in the middle of June, the greater part of the lower surface, except the jugulum and præpectus, are white, and many white feathers of the old plumage are mixed among the dark ones on the upper parts. These dark feathers are more or less uniform blackish; an explicit description of this plumage will be found further on, sub No. 89059. In some males the moulting proceeds more rapidly, in others the process takes longer time. A male shot on the 11th of June, 1883, had much more white than the one referred to above. From this time feathers, more regularly transversely banded, and vermiculated with brown, protrude between the first ones; similarly colored feathers take the place of the white ones below; the first blackish feathers are also shed, until the bird, a little later than the middle of August, has assumed its full summer plumage, in which even the abdomen and the tibiæ are blackish, there being no other white feathers than those of the wings. This perfect plumage lasts hardly fourteen days, as the white feathers of the new winter plumage, simultaneously with the last brown ones, now commence protruding from their sheaths. In the middle of October the bird has the white and brown similarly distributed as in the middle of June, and before the middle of November the perfect white plumage is completed.

The moulting of the wing-feathers takes place about the time when the summer plumage is most perfect, that is to say, about the middle of August. The new primaries have then blackish shafts, a color which in the following spring fades away, so that the old feathers when shed have almost wholly white shafts.

The late Prof. Sven Nilsson was the first who discovered that the ptarmigans yearly shed their claws as regularly and completely as they moult their feathers, an observation fully sustained by my specimens. In the birds shot in July and August, before shedding, the middle claw measures 18 to 20^{mm}, while in a specimen shot on the 23d of August, and which has just thrown the old ones away, the length of the new claw is only 11^{mm}. Most interesting is, however, a male, shot the same day, as it has the claws only half shed, the old claws having loosened from their base and forced 2 to 3^{mm} out, still covering the tip of the new ones, except on two of the toes, in which they have already fallen off (No. 89062).

The old tail-feathers, the white ends of which are wholly worn away, are shed a little later, and replaced by new black ones, with broad white terminal edges in October specimens.

A similar change takes place in the plumage of the females, as the first broad-barred plumage is succeeded by a finely mottled garb, which they assumed later than the males, and which does not seem to reach its full development, as the white feathers protrude before it is finished. In spring the moult of the females commences earlier and takes place more rapidly than in the males.

Since the preliminary report was written I shot another male, on the 19th of October, which at a close examination fully convinces me that there is no distinct third summer plumage, in this species at least. Strange enough, I at first regarded this specimen as a proof against this opinion, so that at one time I really believed in a third summer plumage, as maintained by Professor Newton, because the aspect of the bird, on a superficial look, certainly seems different, especially lighter. But if placed alongside those shot in August it will be seen that the brown feathers on the back are exactly like those of the birds in the perfect dark plumage, and that the light appearance is caused by the new white feathers which are protruding from below the brown ones and shining through them.

I believe that this is the explanation of the third summer plumage in the allied forms also, and the material at hand seems to indicate the same. I am led to this belief by the fact that *L. ridgwayi* is the species which seems to have the most highly developed dark plumage of all forms known to me; further, that it, more than others, shows a tendency to retain a dark color even in winter, consequently warranting the presumption that it ought to have the third fall plumage, if such a thing occurred at all among the allied species.

This tendency to assume a dark color in winter needs further explanation. Among the ptarmigans shot on Bering Island during the winter 1882–'83 a considerable proportion are found having a number of dark feathers among the white ones. Some of these feathers were wholly dark colored, other ones only partially so, with larger or smaller dark spots on the white feathers, sometimes symmetrically, sometimes only on one web, sometimes obliquely over both. Not less than about 6 per cent. among some seven hundred specimens examined were thus marked, males and females, a proportion which held good throughout the winter, at the beginning, in the middle, and at the close.

Such dark feathers among the white ones also occur in the allied species, though not to such an extent, that I am aware of, and has probably given rise to the theory that the dark feathers of the fall plumage fade into the white winter garb without moulting. But if any proofs are needed against this hypothesis my specimens will furnish them. In the first place, I found partially dark feathers in their sheaths, and in the second place, *these dark feathers of the winter plumage are totally different from those of the fall plumage of which they ought to be the remnants!* The postæstival plumage of the males is of a saturated ferruginous brown, with fine, but distinct, blackish vermiculations and cross-bands. The dark feathers of the male's winter plumage are almost wholly black, sometimes with some faint and indistinct brownish undulations and shadings, consequently more like the feathers of the preæstival or spring plumage. The ground color of the summer plumage of the females is of an ochraceous orange color, with rather broad blackish cross-bars; the dark feathers among the white ones in winter are brown, very finely undulated and vermiculated, and consequently very much like those of the fall plumage *of the male!*

One of these females (No. 92717) had a very well pronounced black loral stripe too, as had in fact not a few of them, but upon dissection I found the ovary normal; no trace of sterility, nor indication of any disease.*

The most interesting specimen in regard to this dark winter plumage is a female (No. 92714), the sex of which was also determined by dissection, and which had the ovary well developed and normal. Besides having a mere indication of a black eye-stripe and several brown feathers on the hind neck, the seventh, eighth, ninth, and tenth primaries and the eighth primary covert on each wing are not white, as is otherwise the case in all plumages, both summer and winter, but show the following coloration:

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* This case shows how hyper-cautious the collector must be in indicating the sex. He should make it a rule *never* to mark the sex upon a label if he has not examined the specimen by dissection.

The ground color is a delicate creamy yellow, becoming whitish toward the tip of the interior feathers. The outer web has a series of dusky spots, while the inner one is marbled rather coarsely with blackish, darker toward the base, where the feathers appears dusky with faint light mottlings, while the tip is without dark markings.

Proceeding now to the comparison of *L. ridgwayi* with allied forms it will be well to bear in mind that there are at least four different stages which must be compared with corresponding stages of the other kinds. It would not do to compare a preæstival *L. ridgwayi* with a postæstival *muta*, or a female of the former with a male of *rupestris*. It is, however, on similar comparisons that the present most generally adopted views concerning this interesting group of birds are based. It may furthermore be remarked that we are not satisfied with the negative results furnished by the fact that we hardly can distinguish ptarmigans in their white winter plumage.* Nor do we consider all the rock-ptarmigans identical, even if the distinguishing marks pointed out by the late Professor Sundevall do not hold good. He paid especial attention to the greater or lesser extent of the white markings on the exterior tail-feathers, but later authors have denied the value of this character and proved a great individual variation in this respect. Nevertheless, it seems to me that the characters will average as indicated by him. An observation by me, and verified on a large series of specimens, seems to prove, that the females have more white at the base of the exterior rectrices than the males.

It has already been mentioned that *L. ridgwayi* is sufficiently distinguishable from *L. rupestris* by the uniform black præpectus of its preæstival plumage, agreeing in this respect with *muta* and its allies. From these it is distinguished in its summer plumage not only by the saturated brown color, but especially by lacking every trace of whitish or grayish edgings of the feathers, there being in the postæstival plumage only some faint indications of lighter rusty at the end of a few feathers. I have seen Norwegian specimens of *L. muta* almost without whitish edgings, but it was in every case plainly due to abrasion, while in the

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*This assertion does not seem quite superfluous in view of the following comparison of Dr. O. FINCH: "One specimen [of *alba*] in the uniform white winter plumage from Alexandrovsk is not in the least distinguishable from European specimens (from Russia and Norway) in the museum in Bremen. The distribution of the species [*alba*] *consequently* embraces the whole Arctic region, as is also the case with *L. alpinus* NILSS.

new species they are wanting, as well in the first and not fully grown feathers, as in those of the more advanced season; besides, the two birds could never be confounded on account of the different ground color, this being decidedly grayish in *L. muta.*

There is one point, however, in which *L. ridgwayi* seems to differ from all the known forms of both *muta* and *rupestris*, and that is, that in the perfect summer plumage of the male the feathers of the abdomen and the tibiæ are of a dull, smoky black, a coloration I have not been able to find in any of the numerous specimens of the other species examined by me; nor have I been able to find it mentioned in any description, all of which expressly state that the abdomen is always white.

As might be expected, the female of *L. ridgwayi* differs only very little in color from the females of its congeners. In the præstival plumage the light bars are, perhaps, a little more distant, and the yellow color a shade richer and more brownish orange than in *rupestris.*

A small chick taken on Bering Island, August 5, 1882, shows a great difference from one of corresponding age from Quickjock, in Norwegian Finmarken (U. S. Nat. Mus. No. 33550, July 25, 1862), as it is rich brownish orange with much broader barring and fewer white spots than the rather dull-colored specimen from Norway. A very striking difference also prevails in the coloring of the wing-feathers, which in the pullus of *ridgwayi* are distinctly and broadly barred with orange and blackish, especially the inner ones, while these feathers in *muta* are grayish brown, with minute yellowish gray vermiculations and scarcely any indication of cross-bars. On the other hand, the Norwegian specimen is distinctly barred over the whole breast, while in the Bering Islander the more distant dark cross-bars are confined to the sides of the breast only.

The general size does not differ from its nearest allies, but the bill is considerably longer and stouter, in the latter respect intermediate between *L. alba* and the members of the *Attagen* group, and, as to the bill, probably approaching *L. islandorum* (FABER).

All taken into consideration, I regard *L. ridgwayi* as a well-defined species; in fact, as the best circumscribed form in the whole group, *L. hyperborea* (SUND.) not excepted.

♂ ad.—U. S. Nat. Mus. No. 89059, *L. Stejneger No.* 1167. *Bering Island, June* 6, 1882.

Most of the nasal, mental, and malar feathers, breast, flanks, abdomen, under tail-coverts, primaries, secondaries, and most of the wing-coverts, a few feathers on the lower back, and uropygium, and also the two longest upper tail-coverts, still white, the shafts of the remiges being almost wholly white. The remainder of the plumage is of a dull blackish brown, with ferrugineous brown transverse bars round the neck, the feathers of the lower back and uropygium finely mottled with the same color; a similar mottling is partly seen on many other feathers especially on those of the shoulders.

First primary shorter than sixth; second shorter than fourth, longer than fifth; third equal to fourth, longest. (See list of specimens collected.)

♂ *ad.—U. S. Nat. Mus. No.* 89062, *L. Stejneger No.* 1487. *Bering Island, August* 23, 1882.

Primaries, secondaries, most of the wing-coverts, and the remnants of the feathers covering the tarsus, white, more or less soiled and abraded, except the new feathers in the wings. Forehead and crown black, with ferrugineous brown edging; chin smoky black, with whitish edging. Middle of breast and abdomen, including the peculiar loose and downy feathering of the latter, and the tibiæ, smoky black, the latter whitish at the base and somewhat grayish at the tips, giving these parts a cloudy appearance. The remaining plumage, including the under tail-coverts, distinctly crosswise vermiculated with black and saturated ferrugineous brown, except on the longest upper tail-coverts, and the sides of the abdomen where the design is so indistinct as to become a fine mottling only; in some of the feathers of the back the terminal or subterminal brown is of a somewhat lighter shade. Tail-feathers black to the base, and the white tips wholly worn away. The inner primaries are new and not yet fully out. They have blackish shafts, while those on the three first primaries, still left from the foregoing winter plumage, are almost wholly white.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing beyond tail-feathers.	Wing.	Tail-feathers.	Bill from nostrils.	Remarks.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	
82059	1167	Bering Island	June 6, 1882	♂ ad.	390	......	187	102	10.0	Type!
92713	1342	......do	July 29, 1882	♂ ad.	382	......	193	107	11.2	
89058	1419	......do	Aug. 10, 1882	♂ ad.	387	......	197	112	10.5	
89062	1487	......do	Aug. 23, 1882	♂ ad.	385	......	191	108	12.0	Type!
89060	1489	......do	Aug. 23, 1882	♂ ad.	398	......	190	111	10.5	
92716	1680	......do	Oct. 19, 1882	♂ ad.	396	......	197	111	11.2	Type!
92991	2083	......do	May 25, 1883	(♂) ad.	......	......	197	103	11.0	
92992	2164	......do	June 11, 1883	♂ ad.	391	59	200	112	11.3	
92709	1867	......do	June 11, 1883	♂ ad.	411	73	201	106	10.7	Type!
89061	1165	......do	June 6, 1882	♀ ad.	357	......	182	100	10.0	
89057	1418	......do	Aug. 10, 1882	♀ ad.	376	....	187	94	10.5	Type!
92710	1677	......do	Oct. 9, 1882	♀ ad.	......	......	186	94	10.5	
92714	1869	......do	Jan. 9, 1883	♀ ad.	384	60	185	98	9.5	
92717	1868	......do	Jan. 11, 1883	♀ ad.	375	63	179	91	9.5	
92712	1877	......do	Jan. 19, 1883	♀ ad.	381	75	187	93	9.3	Type!
92715	1891	......do	Jan. 29, 1883	♀ ad.	358	78	182	91	9.7	
92711	1940	......do	Mar. 3, 1883	♀ ad.	384	......	189	89	9.5	
89063	1399	......do	Aug. 5, 1882	pull.	170	......	93	33	5.7	

No. 92713.—Iris dark brown. Contents of gullet: seeds of *Polygonum*.

No. 89060.—Naked portion of toes light pearl gray.

No. 92716.—In the gullet only buds of a *Salix*.

No. 92709.—Bill horny black. Gullet crammed full with ends of *Empetrum nigrum*, and a few leaves of *Rhododendron chrysanthum*.

No. 92717.—Gullet crammed with ends of *Empetrum* and buds of a *Salix*.

No. 92712.—In gullet leaves of *Empetrum* and a few ones of *Rhododendron*.

No. 92715.—Contents of gullet same as of foregoing specimen.

No. 89063.—Iris dark brown.

The "*Kuropatka*" or "*Kuropaschka*," as the natives call the ptarmigan, is very common on both islands, although much more numerous on Bering than on Copper Island. During the winter of 1882–'83 two hunters shot not less than fourteen hundred of them,* and our bill of fare during the whole time from November to March was every day distinguished by ptarmigan in some or another style, and not seldom was its palatable meat served twice a day. The natives, however, do not appreciate it as it deserves, as it is too dry for them, and, if taken ill, they will, by far, prefer a tender old "Tschaika" (sea-gull). It is well so, as otherwise not many ptarmigans would be left. It happened several times that, after an absence of an hour and a half, I returned home with between thirty and forty birds on the sledge. In March the flocks are loose, and, leaving the low-lands, they are then mostly found on the mountains about 600 to 1,000 feet above sea level. Toward the end of April the flocks disband completely, and the cry of the males is heard everywhere among the mountains, while the hen keeps herself better concealed. On a short trip in dog sledge to the south end of the island during the latter part of April I shot as many ptarmigans as I cared for, but they were all single birds and males, without exception.

The habits of the present species do not show any difference from those of the allied ones. It feeds chiefly upon the leaves of *Empetrum nigrum*, partially also on those of *Rhododendron chrysanthum*, more seldom on *Betula nana* and *Salix*, and, in the autumn, on berries and the seeds of *Polygonum*, the latter being a favorite food of the chicks.

On the 6th of July, 1883, I found a nest on Copper Island, close to the seal-rookery at Karabelnij. It was a rough affair consisting of dry grass and a few feathers, with a diameter of 140^{mm}. It contained nine quite fresh eggs (No. 2321, U. S. Nat. Mus. No. 21804), resembling those of the allied species. The long and short diameters measure as follows: 46 by 33^{mm}, 48 by 32.25^{mm}, 46 by 33^{mm}, 45 by 32.5^{mm}, 45 by 32^{mm}, 45 by 32^{mm}, 45.5 by 32^{mm}, 45 by 32.25^{mm}, 45 by 31.5^{m}.

Two eggs of another set, collected in July, 1882, on Bering Island (No. 1393, U. S. Nat. Mus. No. 21805) measure 46.5 by 32.25^{mm}, 47 by 32^{mm}.

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* STELLER gives the following account of the occurrence and tameness of this bird (PALL., Zoogr. *l. c.*): In insula Beringii gregariæ, hominem minime formidantes, ut fustibus occidi et in uno loco intra horæ spatium ad 80 sclopo occidi potuerint, magno naufragorum solatio. The natives even now occasionally kill them with sticks.

Order ACCIPITRES.

Superfamily ACCIPITROIDEÆ.

Family FALCONIDÆ.

90. Falco rusticolus Lin.

1758.—*Falco rusticolus* Lin., Syst. Nat., 10 ed., I, p. 88.—*Id.*, Syst. Nat., 12 ed., I, p. 125 (1766).—Fabricius, Fauna Grœnl., p. 55 (1780).—Mohr, Islandsk Naturh., p. 19 (*part*) (1786).—Gmelin, Syst. Nat., I, p. 268 (1788).—Latham, Ind. Orn., I, p. 28 (1790).—Stejneger, Auk, 1885, p. 188.

1764.—*Falco islandus* Brünnich, Orn. Bor., p. 2, No. 9.—Gmelin, Syst. Nat., I, p. 271.

1776.—*Falco islandus fuscus* Müller, Prodr. Zool. Dan. (p. 73 et p. viii, fide Fabr.).

1780.—*Falco fuscus* Fabricius, Fauna Groenl., p. 56.

1783.—*Falco gyrfalco* Boddaert, Tabl. Pl. Enl. (pl. 210), p. 13 (nec Lin.).—Taczanowski, Bull. Soc. Zool. France, 1883, p. 331.

1788.—*Falco candicans β islandicans* Gmelin, Syst. Nat., I, p. 275.—Schlegel, Rev. Crit., p. i (1844).—*Id.*, Abh. Zool. Anat., I, p. 14 (1884).

1800.—*Falco islandicus* Daudin, Tr. d'Orn., II, p. 100.—Brehm, Lehrb. Vög. Eur., p. 44 (1823).

1800.—*Falco groenlandicus* Daudin, Tr. d'Orn., II, p. 107.—Brehm, Isis, 1826, p. 990.

1854.—*Falco arcticus* Holböll, Zeitschr., Ges. Nat., III (p. 426) (nec *F. communis μ arcticus* Gmel., 1788).

1862.—*Falco gyrfalco groenlandicus* Schlegel, Mus. P. B. Falcones, p. 13.

1862.—*Falco gyrfalco islandicus* Schlegel, Mus. P. B. Falcones, p. 14.

1873.—*Falco holbœlli* Sharpe, P. Z. S., 1873, p. 415.

1882.—*Hierofalco gyrfalco sacer* Bean, Pr. U. S. Nat. Mus., 1882, p. 161 (nec Forst.).

1883.—{ *Falco gyrfalco-candicans*
Falco candicans-gyrfalco } Seebohm, Brit. B. Eggs, I, p. 16.

1884.—*Hierofalco islandus a. holbœlli* Gurney, List Diurn. B. Prey, p. 111.

The Gray Gyrfalcon, as Mr. Gurney appropriately calls this form of the circumpolar species, usually referred to as *Falco gyrfalco*, was the only form obtained on Bering Island during the winter. It was at that season by no means uncommon, and fed chiefly on the numerous field-mice which now infest that island; but, being very shy, specimens were only secured with great difficulty. Whether this species also breeds on the island, I am unable to say, but the female, shot as late as May 5, had the ovaria in such a condition as to make it probable that she was going to breed there. This specimen was just changing from the young to the adult plumage.

The adult female (No. 101193), a very fine specimen in perfect plumage, was collected by Mr. Grebnitski after my departure and kindly presented to me.

I have been unable to distinguish, at present, the alleged races of this particular form, the Greenland *holbœlli* and the typical Icelandic bird. My specimens from Bering Island are rather light, however, and may, perhaps, be nearest related to the Greenland race, if any average differences exist. I should, however, be inclined to the belief that in such case the Pacific bird might be entitled to separate recognition. The paucity and smallness of the dark spots on the under parts would seem to indicate such a possibility, but, as remarked above, I shall not venture to separate the possible races of the Gray Gyrfalcon, at present.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Chord of culmen from cere.	Tarsus.	Middle toe without claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92719	1795	Bering Island	Dec. 13, 1882	♂	524	62	370	202	23	64	51
92718	1930	....do..............	Feb. 28, 1883	♂	515	52	374	210	22	65	49
92720	1959	....do..............	Mar. 23, 1883	♂	518	......	360	205	22	66	51
92721	2011	....do..............	May 5, 1883	♀	573	76	395	228	25	64	49
101193	*64	....do	Jan. —, 1884	(♀) ad.	......	......	413	234	25	66	51

* Grebnitski.

No. 92719.—Bill and cere bluish white; tip, including tooth, horny black; naked eye-ring white, faintly tinged with bluish. Feet white with a faint tinge of blue and yellow; nails uniform, horny black. Contents of crop: two *Arvicolæ*.

No. 92718.—Bill very light bluish gray; tip, including tooth, blackish; naked eye-ring bluish white with a strong yellowish wash behind the eye. Feet dirty white with a slight tinge of blue and yellow (not green, however!). In the stomach a ball of hairs of *Arvicolæ*. Rather fat. Weight, 4 pounds. New feathers in sheaths protruding all over the body, especially on the back.

No. 92720.—Iris dark brown. Bill light grayish blue, tip and tooth blackish; cere and naked eye-ring light bluish gray with a yellowish tinge. Feet dirty bluish white with a yellowish wash. Testes not swollen. Crop and stomach filled with remains of several *Arvicolæ*. Not fat. Weight, 4 pounds. New feathers in sheaths here and there all over the body.

No. 92721.—Bill light bluish gray, terminal half of both mandibles dark horny blue; naked eye-ring light bluish gray; cere gray with an olive shade. Feet bluish white, yellowish underneath. Ova swollen, the diameter of the largest being 5.5^{mm}. Crop and stomach empty. Extremely fat. Weight, 4½ pounds. New feathers protruding.

91. Falco islandus BRÜNN.

1764.—*Falco islandus* BRÜNNICH, Orn. Bor., p. 2, Nos. 7 and 8.—FABRICIUS, Fauna Grœnl., p. 58 (1780).—LATHAM, Suppl. Synops., I, p. 282 (1787).—STEJNEGER, Auk, 1885, p. 187.

1783.—*Falco gyrfalco* BODDAERT, Tabl. Pl. Enl. (pl. 446), p. 26 (*nec* LINN.).—*Accipiter gyrfalco* SCHÄFFER, Mus. Orn., p. 7, pl. i (1789).—BREHM, Lehrb. Vög. Eur., p. 43 (1823).—PALLAS, Zoogr. Ross. As., I, p. 324 (1826).

1786.—*Falco rusticolus* MOHR, Islandsk Naturh., p. 19 (*part*).

1788.—*Falco islandus β albus* GMELIN, Syst. Nat., I, p. 271.

1788.—*Falco islandus γ maculatus* GMELIN, Syst. Nat., I, p. 271.

1788.—*Falco candicans* GMELIN, Syst. Nat., I, p. 275.—DALL & BANNIST., Tr. Chic. Ac., I, 1869, p. 271.—BLAK. & PR., Ibis, 1878, p. 249.—PALMÉN, Swed. Cat.

London Fish. Exhib., p. 304 (1883).—Saunders, Ibis, 1883, p. 350.—Dybowski, Bull. Soc. Zool. France, 1883, p. 351.—*Hierofalco o.* Stejneger, Pr. U. S. Nat. Mus., 1883, p. 71.

1790.—*Falco islandicus* Latham, Ind. Orn., I, p. 32.—Audubon, Birds Am. (pl. ccclxvi) (1831).

1806.—*Falco grœnlandicus* Turton, Gen. Syst. Nat., I (p. 147) (*nec* Daudin, 1800).—Hancock, Ann. N. H., II, p. 249.

1854.—*Falco islandicus candicans* Holböll, Zeitschr. Ges. Naturw., III (p. 426).

1860.—*Falco gyrfalco* var. *candicans* Schrenck, Reis. Amurl., I, p. 228.—*Hierofalco g. c.* Nelson, Cruise Corwin, pp. 77 and 56 *e* (1883.)

1874.—*Hierofalco holbœlli* Sharpe, Cat. B. Brit. Mus., I, pl. xiii, right-hand figure.

The White Gyrfalcon breeds on Bering Island, though in limited numbers only. A pair had their nest in a steep and inaccessible rock in the so-called "Nakovalnaja," a couple of miles from the main village. One of the old birds (No. 89126) was shot on the 27th of August. It is pure white underneath, spotted above, with black streaks on the crown and blackish, cordate spots on back and wings; the tail is uniform white, with dusky mottlings along the edges. This bird is the whitest of a large series in the National Museum.

The other specimen (No. 92722), a female, shot May 2, 1883, is pure and unspotted white below; the dark spots on the upper surface are brownish and very much faded and rather few; the form of these spots shows that the bird is in the "tear-dropped" stage; the streaks on top of head are very narrow; tail uniform white, with only faint brownish mottling along the edge.

The breeding of the White Gyrfalcon under latitude 55° is very interesting, and affords additional proof of the distinctness of this species as compared with *F. gyrfalco* and its allies. As to the name here applied, *Falco islandus*, I refer to my article in "The Auk," 1885, p. 185.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Culmen from cere.	Tarsus.	Middle toe without claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89126	1627	Bering Island	Aug. 27, 1882	(♂)? ad.	......	......	400	235	27	70	51
92722	2006	....do...............	May 2, 1883	♀	598	84	413	233	24	66	......

No. 89126.—Bill bluish white, with a faint yellowish tinge, dark bluish gray at tip; cere dark bluish gray. Feet white, with a faint bluish tinge above, and a more yellowish cast below; nails dark bluish gray, whitish along the edges.

No. 92722.—Bill very light bluish gray, tip and tooth darker; cere and naked eye-ring with a faint yellowish wash. Feet white, with a faint bluish and yellowish tinge, both colors independently discernible; claws light horny brownish gray, at tip and below whitish. Extremely fat. In the crop was found meat, fat, and feathers of a gull.

92. Falco pealei Ridgw.

1854.—*Falco polyagrus* Cass., Illustr., pl. 16 (dark figure!).
1873.—*Falco communis* var. *pealei* Ridgw., Bull. Essex Inst., V, 1873, p. 201.
1874.—*Falco gyrfalco* Ridgw., Am. Nat. VIII, 1874, p. 434 (*nec* Lin.).—Dall, Avif. Aleut. Isl. west Unal., p. 3 (1874).
1881.—*Falco peregrinus pealei* Ridgw., Nomencl. N. A. Birds, p. 37.—*Id.*, Ibis, 1882, p. 297 (foot-note).—Nelson, Cruise Corwin, p. 78 (1883).—Turner, Auk, 1885, p. 157.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Chord of culmen from cere.	Tarsus.	Middle toe without claw.	Stretch of wing.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92726	1876	Bering Island	Jan. 19, 1883	♂ ad.	442	7	342	161	22	50	48	1045
92724	1800	....do	Dec. 9, 1882	(♀) ad.	......	......	385	194	26	59	51	......
92725	2080	....do	May 18, 1883	(♀) ad.	(502)	......	382	196	25	57	56	......
92723	1862	....do	Jan. 9, 1883	♀ jun.	482	40	380	195	25	56	55	1158
Dybowski....		.. do	Apr. 5, 1882	(♂) jun.	......	......	330	170	......	49	48	......
Grebnitski ..		....do	....	(♀) jun.	(498)	(50)	378	200	......	56	52	(1145)

No. 92726.—Iris dark brown. Bill with the terminal half bluish gray, darkening toward the tip and tooth, behind fading into the light yellowish gray color of the basal half; cere bright yellow; naked eye-ring pale yellow. Feet vivid golden yellow; claws blackish gray. Stomach contained feathers of a sea bird. Extremely lean, probably resulting from an old shot wound. Weight, 2¼ pounds. New feathers in the sheaths protruding all over the body.

No. 92724.—Bill bluish white. Culmen, tip, and tooth horny bluish black; cere and naked eye-ring yellow. Feet yellow; claws black.

No. 92723.—Iris dark brown. Bill, cere, and naked eye-ring very light bluish gray with a faint yellowish tinge; terminal half of culmen and of upper tomia, including the tooth, as also the tip of lower mandible, horny blackish blue. Feet pale straw yellow with a faint greenish tinge; claws horny black. Stomach containing a few feathers only; in the crop a piece of meat. Very fat. Weight, 3¼ pounds.

The "*Tschornij Jastrip*" (*i. e.*, Black Hawk), as the natives call the present bird in Russian, or "*Agulekh*," as they name it in Aleutian, is a common resident of both islands, breeding in high and inaccessible cliffs.

Peale's Falcon, first described by Mr. Ridgway in 1873, seems to form a constant and well-circumscribed offshoot from the *peregrinus* stock, the constancy of its characters securing for it the title of species and the benefit of a binominal only.

All the specimens of this form which I have seen are remarkably uniform, both in the adult and the young plumage. The two adult females which I procured are in every respect counterparts of the typical female (U. S. Nat. Mus. No. 63413) described by Mr. Ridgway in "The Ibis," 1882, p. 297 (foot-note). The adult male has not been described, as far as I am aware, so that the following description may not be out of place:

♂ *ad. U. S. Nat. Mus. No.* 92726; *L. Stejneger No.* 1876. (*Bering Island, Kamtschatka, January* 19, 1883.)

General color of upper surface clear plumbeous, darker, nearly blackish slate on the interscapuleum, the transition to the lighter color of the lower back and the uropygium formed by the light margins and cross-bands on the posterior interscapulars; the crown and nape are considerably darker than the lower back, but still distinctly plumbeous, and not blackish, with well defined, narrow, black, shaft-streaks; lower back rather indistinctly barred with dark plumbeous, the bars becoming deeper and more distinct on the uropygium and upper tail-coverts, and only half as broad as the light interspaces. Upper surface of the wings, primaries excepted, anteriorly blackish slate, gradually turning into plumbeous posteriorly, harmonizing with the adjacent parts of the back; the lesser wing-coverts, consequently, are nearly uniform blackish slate with slightly paler margins; those following have narrow, light cross-bars in addition, while on the larger coverts and the secondaries the light and the dark bars are of about equal breadth; primaries and primary coverts black, externally with a plumbeous tinge, the latter ones, as also the inner ones, of the former, narrowly tipped with whitish; the inner webs of the primaries with withish (more or less mottled with dusky), lense-shaped cross-spots, except on the terminal one-fourth. Tail light plumbeous, darkening somewhat toward the tip and covered by distinct blackish bars, generally narrower than the light interspaces; tips dirty whitish. Lower surface white, from the breast backward lightly tinged with plumbeous and with a general, but faint, wash of buff all over; chin and throat nearly immaculate, only a few black, hair-fine shaft-streaks on the latter; on the jugulum these streaks become gradually heavier and more numerous, and most of them widening at the lower end into small "teardrops;" breast, sides, and flanks transversely barred with blackish, the bars on the breast, however, not being continuous, as they consist of series of transverse spots of a somewhat cordate form, near the tip of the feathers, but not reaching the edges; the width of these bars averages 3 to 4^{mm}, and the white interspaces 4 to 5^{mm}; further back, on belly, thighs, crissums, and under tail-coverts the dark cross-lines gradually become more plumbeous, more distinct, and narrower, the black lines averaging about 2^{mm}, the light interspaces 4 to 5^{mm}. Under wing-coverts and axillaries barred with very sharply defined black and white bands of nearly equal width, except on the axillaries, where the white predominates. Mustache, subloral region, the feathers bordering the naked eye-space, and a postocular streak slaty black; subocular and auricular region exactly like the top of the head, the dark shaft-stripes being a trifle less distinct perhaps, connecting with the white of the throat behind the mustache. For colors of bill, feet, and iris, as well as dimensions, see under "List of specimens obtained." Second primary longest, first one scarcely longer than third; only the first with inner web emarginated.

The young female, No. 92723, agrees in every particular with the type (U. S. Nat. Mus., No. 12022), the brown color being only somewhat darker, which is probably due to the fact that the type is mounted and has been on exhibition for many years.

Two young specimens had been collected on Bering Island during the winter previous to my arrival there, one, the male, belonging to Dr. Dybowski, the other, the female, to Mr. Grebnitski. With the kind permission of these gentlemen I made an accurate description of the two birds, which is here appended, the dimensions being incorporated with the "List of specimens obtained."

♂ *jun.* (*Bering Island, April* 5, 1882).

Upper surface blackish brown, faintly tinged with bluish slate, and with faint buffy edges to each feather, which are lighter and broader, nearly whitish, on neck and fore part of the crown; forehead buffy white, with the shafts black; a stripe underneath and behind the eye, and a large patch underneath and behind the mouth blackish brown; chin and cheeks buffy white, the latter with blackish brown longitudinal stripes. Lower surface blackish brown, with buffy white edges on each feather which, besides, is crossed by one or two broad angular bars of similar color, the angle pointing towards the tip of the feather; these cross-bars are concealed, however, by the overlying feathers; on the abdomen and flanks these bands are reduced to rounded spots situated near the margin of the feathers and somewhat exposed; under tail-coverts buffy white with black transverse bars. Upper aspect of the wing similar to the rest of the upper surface, each primary having numerous buff transverse spots on the inner web towards the margin; under wing-coverts like the under surface of the body, except that the whole margin and not the edges alone are light colored, and that the angle of the light cross-bar points towards the base instead of the tip of the feathers. Tail brownish black tinged with slate gray, with buff-colored transverse spots along the margin of the inner webs, and corresponding dots of the same color on the outer webs; all tail-feathers narrowly tipped with whitish. First primary equal to third, and 10^{mm} shorter than the second, which is longest; fourth 23^{mm} shorter than third.

♀ *jun.* (*Bering Island.*)

Agrees closely with the foregoing in general coloration, but the under wing-coverts show less light, the buffy margins and spots being much narrower. On the under side of the body the pattern of the individual feather is somewhat different, as those of the breast have the concealed angular cross-bands reduced to marginal spots, while those on the belly, as a rule, have only such a spot left in one of the webs, and often wanting altogether. First primary 2 to 3^{mm} longer than third, and about 7^{mm} shorter than second, which is longest; fourth 24^{mm} shorter than third; inner web of first only sinuated.

93. Archibuteo lagopus (Brünn.).

1764.—*Falco lagopus* Brünnich, Orn. Bor., p. 4.—*Accipiter l.* Pallas, Zoogr. Ross. As., I, p. 360 (1826).—*Buteo l.* Middend., Sibir. Reis., II, 2 (p. 126) (1853).—Dybow., Bull. Soc. Zool. France, 1883, p. 351.—*Archibuteo l.* Dall. & Bannist., Tr. Chic. Acad., I, 1869, p. 272.—Taczan J. f. Orn., 1872, p. 347.—*Id.*, Bull. Soc. Zool. France, 1876, p. 123.—*Id.*, *ibid.*, 1883, p. 330.—*Id.*, Orn. Faun. Vost. Sibir., p. 10 (1877).—Blakist. & Pryer, Ibis, 1878, p. 248.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 238.—*Iid.*, *ibid.*, X, 1882, p. 182.—Blakist., Amend. List B. Jap., p. 67 (1884).—*Aquila l.* Seeb., Ibis, 1884, p. 43.

1882.—*Archibuteo lagopus sancti-johannis* Bean, Pr. U. S. Nat. Mus., V, July 25, 1882, p. 162 (*nec* Gmel.).—Nelson, Cruise Corwin, p. 79 (1883).

The Rough-legged Buzzard did not put in its appearance during my sojourn, and it was only with a query that my manuscript notes referred to this species as being probably the "brown hawk," which the natives told me was occasionally seen. A fine specimen was, however, included in the valuable collection which Mr. Grebnitski had the kindness to send me in 1884, thus insuring beyond doubt the correctness of the identification. As yet, the species is only an occasional visitor to the islands, but it would not be surprising to learn, in a not distant future, that it had become a breeding bird. The *Arvicolæ* were introduced only a few years ago, but are now so extremely abundant that they might afford food for a numerous colony of birds of prey.

The specimen in question shows no appreciable difference from birds of Europe, Japan, or Northwestern America. The suspicion of Taczanowski, that the Kamtschatkan specimen, which presented some peculiarities of coloration, might belong to a separate race (Bull. Soc. Zool. France, 1883, p. 330), seems, therefore, not well founded. On the other hand, after comparison, I agree perfectly with Mr. Nelson (*l. c*), that the Alaskan specimens are indistinguishable from the palæarctic form.

The specimen, alluded to above, measures as follows:

" ♀ " *U. S. Nat. Mus. No.* 101194; *Grebn. No.* 65. *Bering Island, January,* 1884.

Wing, 430^{mm}; tail-feathers, 243^{mm}; culmen from cere, 25^{mm}; commissure, 41^{mm}; tarsus, 77^{mm}; middle toe without claw, 35^{mm}.

94. Haliæetus leucocephalus (LIN.).

1766.—*Falco leucocephalus* LIN., Syst. Nat., 12 ed., I, p. 124.—KITTL., Kupfert, I, p. 4 (1832).—*Aquila l.* PALL., Zoogr. Ross. As., I, p. 347 (1826).—KITTL., Denkw., II, p. 278 (1858).—*Haliætus l.* STEPH. in Shaw, Gen. Zool., XIII, 2, p. 13 (1826).—DALL & BANN.. Tr. Chic. Ac., I, 1869, p. 272.—FINSCH, Abh. Brem., Ver., III, 1872, p. 22.—DALL, Avif. Aleut. Isl., Unal eastw., p. 2 (1873).—*Id.*, Avif. Aleut. Isl., west Unal., p. 3 (1874).—BEAN, Pr. U. S. Nat. Mus., 1882, p. 162.—NELSON, Cruise Corwin, p. 30 (1883).—HARTLAUB, J. f. Orn., 1883, p. 263.—STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 66.—*Id.*, Naturen, 1884, p. 8.—PALMÉN, Swed. Cat. Lond. Fish. Exh., p. 203 (1883).—SAUNDERS, Ibis, 1883, p. 350.—TURNER, Auk, 1885, p. 157.

1826.—*Aquila pelagica* PALL., Zoogr. Ross. As., I, p. 143 (*part*).

The Bald Eagle inhabiting Bering Island is here recorded under the name of *H. leucocephalus*, though I am, by no means, satisfied as to the propriety of so doing, since all the specimens which I have obtained and those which I have had the opportunity of examining—altogether eleven specimens—indicate certain differences from typical *leucocephalus*, which make me believe that we will have to recognize ultimately a northwestern race of this bird, somewhat corresponding to the northwestern race of the gray sea eagle, which Faber has designated as *H. albicilla borealis*. I do not deem the material quite sufficient, however, to decide the question, for, although twenty-four specimens are not a despisable number of so large a bird, the fact that the sexing in many cases is evidently unreliable, while in others no determination of the sex has been attempted by the collector, makes it less valuable and conclusive than would otherwise have been the case. It may therefore be considered best only to present the facts as they are before me, leaving the question open for future investigation. Any one looking at the Bering Island birds will at once be impressed by their much larger size as compared with specimens from the American continent, the extremely powerful bill and claws being particularly striking, in proof of which I submit the following tables of dimensions. I may remark that the sex is given in parenthesis, when not verified by Mr. R. Ridgway or myself by dissection, and furthermore that the specimens from the States are the largest ones I could pick out. All specimens with black tails are recorded as young, while those with the rectrices white, or more white than black, are given as adult.

TABLE I.—*Specimens from Bering Island.*

U. S. Nat. Mus. No.	Collector and No.	Sex and age.	Locality.	Date.	Wing.	Tail-feathers.	Culmen from cere.	Radius of curvature of culmen from cere.	Height of upper mandible at fore border of cere.	External chord of hind claw.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
101198	Gr. 74	(♂) ad.	Bering Island......	Feb., 1884	635	310	53	31	28	44
101196	Gr. 77	(♂) jun.	......do............	Mar., 1884	650	346	51	30	27	42
92739	St. 1685	jun.	......do............	Oct. 15, 1882	715	390	55	34	30	47
101195	Gr.	jun.	......do............	Oct., 1883	677	350	54	34	29	47
101197	Gr. 24	(♀) jun.	......do............	Oct., 1883	705	380	58	33	31	47
92740	St. 1783	♂ jun.	......do............	Dec. 5, 1882	648	332	52	32	29	42
92741	St. 1781	♀ jun.	......do............	Dec. 2, 1882	705	370	59	33	31	49
	Grebn.	jun.	......do............	....	680	350	58	35	31	47
	Grebn.	jun.	......do............	....	690	375	57	36	31	47
	Grebn.	jun.	......do............	....	700	370	57	39	31	49
	Grebn.	(♂) ad.	......do............	....	600	310	52	32	28	41

TABLE II.—*Typical* H. LEUCOCEPHALUS *from the United States.*

U. S. Nat. Mus. No.	Collector and No.	Sex and age.	Locality.	Date.	Wing.	Tail-feathers.	Culmen from cere.	Radius of curvature of culmen from cere.	Height of upper mandible at fore border of cere.	External chord of hind claw.
11986	Drexler...	(♀) ad.	Philadelphia, Pa.....	.... .., 1857	650	314	54	31	29	42
41595	....	jun.	Washington, D. C....	....	625	315	53	32	29	42
77911	Horan	(♀) jun.	......do..............	.... .., 1879	570	281	50	28	26	38
97398	McDonald	♀ jun.	Virginia.............	Apr. 8, 1884	670	330	54	31	28	45
12017	Drexler..	(♂) ad.	Philadelphia, Pa.....	.... .., 1657	575	252	47	28	25	38
92501	Ridgway..	♂ ad.	Fairfax County, Virginia.	Nov. 29, 1883	575	255	48	28	25	38
11998	....	(♀) ad.	Louisiana	....	610	288	49	27	24	38
41237	Drexler...	ad.	Washington, D. C....	....	585	287	50	......	25	37

TABLE III.—*Specimens from Southern Alaska.*

U. S. Nat. Mus. No.	Collector and No.	Sex and age.	Locality.	Date.	Wing.	Tail-feathers.	Culmen from cere.	Radius of curvature of culmen from cere.	Height of upper mandible at fore border of cere.	External chord of hind claw.
70093	Pauslin...	(♀) ad.	Kodiak	....	635	313	51	30	27	40
45835	Bishoff....	(♀) ad.	Sitka................	Feb., 1866	650	302	54	33	29	41
45838	Bishoff....	(♂) ad.	....do................	Jan., 1866	635	296	50	30	27	39
52509	Bishoff ...	ad.	Kodiak	....	645	305	53	32	29	43
45836	Bishoff....	(♂)jun.	Sitka................	Apr., 1866	615	305	51	30	26	38

It will be seen that the difference between the dimensions of the specimens of Table I and those of Table II is quite considerable, the females of the latter being about the size of the males of the former. A comparison of the specimens furthermore shows, that there is a not less marked difference in color. The adults from Bering Island lack the peculiar chocolate brown characteristic of the southern birds, the brown of the former being rather a smoky brownish black.

So far the two apparent forms seem easily distinguishable, but here the specimens, the dimensions of which are given in Table III come in between, and, in this case especially, the uncertainty in regard to the sex interferes, making it impossible to reach a conclusion. Two specimens are labeled "♂," two others are said to be "♀," but here is evidently an error, for it can hardly be doubted that Nos. 70093 and 45838 are of the same sex, notwithstanding the statement of the collectors to the contrary, and I am strongly inclined to think that all the five birds enumerated in Table III belong to the same sex. But here is where the difficulty comes in, for it depends upon their sex to which of the above forms they are referable; their size is about that of the males from Bering Island and that of the females from the south, so that they belong to the former group if males, to the latter if females. Nor does the color help us out of the difficulty. The Kodiak and Sitka birds are darker than southern specimens, though still perceptibly "chocolate" brown. At present, however, I am inclined to regard these birds as belonging to the southern race.

Finally I submit the "remarks" relating to the specimens collected by me.

No. 92739.—Bill black; lower mandible and cere very dark olive gray, corner of mouth orange. Feet vivid yellow.

No 92740.—Total length, 893^{mm}; tail beyond tip of closed wings, 77^{mm}; stretch of wings, 2.188^{m}. Weight, 10¼ pounds. Stomach empty. Exceedingly fat.

No. 92741.—Total length, 1.010^{m}; tail beyond closed wings, 105^{mm}; stretch of wings, 2.330^{m}. Weight, 14¼ pounds. Bill horny black; towards the base fading into yellowish; cere dark olive; corner of mouth yellowish orange; naked eye-ring yellow. Feet golden yellow. Stomach empty. Exceedingly fat.

The Bald Eagle is not so abundant on Bering Island as it used to be, judging from the numerous deserted nests which are pointed out by the natives, and it is only in the southern and more mountainous part of the island that one is now sure to find it. My researches have proven that this is the eagle of which Steller speaks as inhabiting the island, and not *Thalassoaëtus pelagicus*, as Pallas erroneously supposed. Thinking it of interest to embody all the results of my investigations here, I simply reprint the following from my preliminary report, having no additional evidence to offer:

"Steller, in his description of Bering Island, mentions a sea eagle in the following terms: 'Von seltnern, an der sibirischen Küste nicht gesehenen Vögeln habe ich dort [Bering Island] einen besondern Seeadler mit weissem Kopf und Schwanz * * * angetroffen * * * jener nistet auf den höchsten Felsen, und sie haben im Anfang des Junius Junge, die ganz mit weisser Wolle bedeckt sind.' This is the same bird of which he speaks in his 'Beschreibung von dem Lande Kamtschatka' (1774), pp. 193–194, as follows: 'Eine Art unbekannter und sehr schöner Adler, so aber in Kamtschatka viel seltsamer vorkommen als in America und den Inseln im Canal, dahero auch solche bis diese Stunde noch nicht erhalten können. Es ist derselbe so gross als der *Haliætus*, ganz schwarz, ausgenommen den Kopf, *Uropygium*, schwarze Füsse[*] und Schenkel, welche so weiss als Schnee sind. Er macht sein Nest auf hohen Felsen, aus Reisern im Diameter von einen Faden einen Schuh dicke und legt seine Eyer gegen den Anfang des Junii, zwey an der Zahl. Die Jungen sind ganz weiss, ohne einige Flecken; und stiesen die beyde Eltern, da ich auf Bärings Eilande das Nest besahe, dergestalt auf mich zu, dass ich mich kaum ihrer mit dem Stock erwehren konnte. Ohnerachtet ich den *Pullo* keinen Schaden zugefüget, verliesen die Alten dennoch das Nest und baueten sich ein anderes an einen Felsen wohin niemand möglich zu kommen.'

"I think there can be little doubt that the bird thus described is a

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[*] This is completely senseless. I conjecture it to be a misprint for "Schwanzedern."

Haliæetus leucocephalus (Linn.) in spite of the white 'thighs,' which perhaps is only a *lapsus calami* of the person copying the original manuscript, this being, as we know, only a rough draft of Steller's, in common with the 'black feet.' The following are my special reasons: 1. The habitat given by Steller agrees exactly with that of *H. leucocephalus*, while *T. pelagicus* is common in Kamtschatka, and does not occur at all in America; 2. 'White head' can only be said about *leucocephalus* and not of *pelagicus*, which has merely the forehead white; 3. If Steller had intended to describe the *pelagicus* he would not have overlooked the white shoulders, a much more conspicuous feature than the white forehead; 4. Even if Steller's manuscript contained the words 'thighs white' it would be of little importance, as it seems that he did not kill the bird and only made the description from the living animal. In *pelagicus* the whole abdomen is white. The supposition here advanced seems the more plausible, as a pair certainly belonging to this species still breeds in the neighborhood of the place where Steller and his comrades wintered." (Proc. U. S. Nat. Mus., VI, 1883, p. 66.)

95. Haliæetus hypoleucus RIDGWAY.

1883.—*Halliæetus* sp. STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 67.
1883.—*Halliæetus hypoleucus* "Stejneger MSS.," RIDGW., Pr. U. S. Nat. Mus., 1883, p. 90.—STEJNEGER, Naturen, 1884, p. 8.
1884.—*Haliaëtus albicilla* subsp. *hypoleucus?* GURNEY, List Diurn. B. Prey, p. 58.

The type specimen of the present species is still unique, and its status consequently somewhat doubtful. But, before proceeding to discuss it, the original description by Mr. R. Ridgway may be advantageously reprinted as follows:

"*Young* ♀ (No. 89127, collector's No. 1055, Bering Island, May 15, 1882). Ground color of pileum, nape, upper back, rump, with lesser and middle wing-coverts dirty white, spotted with grayish brown, the spots of the latter color being chiefly subterminal, but often occupying the tips of the feathers; upper part of rump with white largely predominating; greater wing-coverts and longer scapulars uniform dusky, bordered terminally with mottled dirty grayish white; tertials uniform slate-dusky; upper tail-coverts mottled dusky terminally, mottled white basally; remiges uniform brownish black; rectrices blackish dusky, the inner webs much mottled with pale grayish and buffy white. Side of head with a broad and distinct stripe of nearly uniform brown, occupying the entire orbital and auricular regions. Entire lower parts white, all the feathers with distinct dusky shafts; those of throat streaked with pale brown, those of jugulum and upper breast with a large terminal spot of dusky, many of the feathers of sides and abdomen with small and usually indistinct brown terminal spots; thighs and crissum dirty white, the feathers with dusky terminal spots, these largest on crissum, and on upper and inner portions of thighs coalesced so as to form the predominating color. Under side of wing white, spotted with dusky." (Proc. U. S. Nat. Mus., VI, 1883, p. 90.)

My remarks on the fresh bird read as follows:

> Iris faint yellowish white. Bill horny brown; cere yellow, on culmen shaded with horny brown. Feet vivid golden yellow.
>
> *Dimensions.*—Total length, 890$^{\text{mm}}$; stretch of wings, 2.220$^{\text{m}}$; wing, 630$^{\text{mm}}$; tail-feathers, 322$^{\text{mm}}$; culmen from cere, 56$^{\text{mm}}$; radius of curvature from cere to tip, 35$^{\text{mm}}$; height of upper mandible at fore border of cere, 29$^{\text{mm}}$; external chord of hind claw, 44$^{\text{mm}}$.

In my preliminary report (Proc. U. S. Mus., VI, 1883, p. 67), when comparing it with the young of *H. leucocephalus*, I stated that "the size is not inconsiderably less than that of the bald eagle, as the specimen in question represents the largest size of its kind, being not larger than an old male of the said species. The bill is fully equal in size to that of a young *leucocephalus*, and the feet likewise; but the body, tail, and wings are smaller."

My friend, Mr. R. Ridgway, on the other hand, thought that it compared better with the adult male of *H. albicilla* "as for size and proportions" (*l. c.*, p. 91, foot-note), at the same time indicating as a possibility that it might be "the eastern representative" of the latter (*l. c.*, p. 90), a statement which has evidently induced Mr. Gurney to reduce it to a subspecies, as *H. albicilla hypoleucus*, though adding a query, it is true. Mr. Ridgway, however, has now reversed his opinion after having seen the enormous eagles which I brought back from Bering Island, the subjects of my comparison, while at the time, when he wrote his remarks, he had only specimens of the much smaller form for comparison. His remarks, that the "bill and feet are much larger than in a specimen of the bald eagle of equal size so far as other measurements are concerned," are therefore in complete harmony with those of mine, that "the size is in some respects inferior to that of the bald eagle, the bill holding fully the size of that of a young *H. leucocephalus*, and the feet likewise, but the body, the wing, and tail being smaller." What we both wished to express and emphasize was the disproportion between the dimensions of the other parts and those of the bill and feet.

In this connection I will call attention to another character of the specimen under consideration, in which it differs from all the other specimens of both *H. leucocephalus* and *albicilla*, viz, the great length of the culmen of the cere, as also the great breadth of the back of the bill, just between the horny part and the frontal feathering. The former dimension is 20^{mm}, and the latter, as measured at the middle, is 13^{mm}, figures considerably larger than the maximum dimensions of even the most gigantic specimens at my command.

No satisfactory explanation having as yet been found for the curious concomitancy of the new dark tail-feathers with the yellowish irides and the rather light colored cere, I only reiterate Mr. Ridgway's remarks (*l. c.*, p. 91, foot-note):

"The middle rectrices have been moulted, and those of the new dress are just making their appearance. *They are even darker in color than the old ones*, although similarly marked, which would indicate either that the individual in question would not have attained its perfect plumage the next year, or else that the adult does not have a white tail. That the specimen is not in its first year is clearly indicated by the character of the plumage, as well as by the date of its capture (May 15); while that it is probably more than two years old is strongly suggested by the light color of the bill and cere which in *H. albicilla* and *H. leucocephalus* do not become yellowish until the bird begins to assume a portion of its adult livery."

The most striking feature of the bird, however, is the general white color of the plumage, and after having examined the ample material of the National Museum I must still repeat what I said when first calling attention to the bird, viz, that "I have never seen a young *Haliæetus* with the whole lower surface almost white, and the upper side with dark tips and edgings on a whitish bottom, such as my No. 1055." (*L. c.*, p. 67.)

It is but fair to state, however, that I have seen a bird, a young female *leucocephalus*, which was shot in Virginia April 8, 1884, by Col. M. McDonald, which, in regard to general coloration, is intermediate between the average style of *leucocephalus* and my bird. Still there is a considerable distance between the two specimens. They are apparently of about the same age, but the Virginia bird had the usual dark bill and cere, and brown irides, and the proportions, both of body and bill, are normal.

If the present bird is nothing more than a very extraordinary individual variety of *H. leucocephalus*, its true habitat is somewhere outside of Bering Island, to which island it then comes as an accidental visitor only. It should especially be looked for toward the northern part of Kamtschatka, since in that country there is a vague rumor that white-bellied eagles live on the great Karaginski Island. It must be borne in mind that Kamtschatka is peculiar for the development of the white color in the plumage of its birds, a very interesting instance of which is the pure white *Astur candidissimus* Dyb.

The negative fact that I did not procure more than the single specimen is therefore no evidence against the validity of the species. It will be seen that nothing has happened since the establishment of the name that changes its status. The same reasons for supposing it to be distinct then, exist to-day.

Haliæetus hypoleucus is therefore retained for further attention and investigation.

96. Haliæetus albicilla (Lin.).

1758.—*Falco albicilla* Lin., S. N., 10 ed., I, p. 89.—Kittl., Kupfert., I, p. 4, pl. ii, fig. 2 (1832).—*Id.*, Denkwürd., II, p. 278 (1858).—*Aquila a.* Pallas, Zoogr. Ross. As., I, p. 347 (1826).—*Haliætus a.* Temm. & Schl., Faun. Jap. Av. (p. 13) (1847).—Schrenck, Reis. Amurl., I, p. 223 (1860).—Taczan., Bull. Soc. Zool. France, 1876, p. 120.—*Id.*, *ibid.*, 1883, p. 329.—Blakist. & Pryer, Ibis, 1878, p. 247.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 237.—*Iid.*, *ibid.*, X, 1882, p. 180.—Bolau, J. f. Orn. 1880, p. 114.—Blakist., Chrysanthemum, 1882, p. 427.—*Id.*, Amend. List B. Jap., pp. 19, 66 (1884).—Dybowski, Bull. Soc. Zool. France, 1883, p. 351.—Stejneger, Naturen, 1884, p. 8.

I did not myself succeed in getting a specimen of this species during my sojourn at the islands, and was consequently highly gratified by receiving the following year a specimen from Mr. Grebnitski. This was the more welcome as it was an adult male, so that there cannot be any possible doubt as to the identity of the species. On Bering Island the species is only an occasional visitor from Kamtschatka.

The specimen was particularly acceptable, since I was thereby enabled to ascertain the value of the statement of Kittlitz, that the Kamtschatkan specimens, collected by him, were much paler than European birds. I was the more prepared to suspect the eastern birds of being distinct, since Pallas, in speaking of a Kamtschatkan variety which he considers different, asks: "An species distincta?"

The specimen collected by Mr. Grebnitski contradicts entirely the statements of v. Kittlitz and Schrenck (*l. c.*), it being so far from lighter than average European specimens that the new feathers which are coming out seem to be unusually dark. The remains of the old plumage are very bleached, however, and as v. Kittlitz's specimens probably were obtained during the latter part of the summer, bleaching may account for their lighter color. (Cf. that Schrenck's very dark birds were obtained in January and February.) As to the differences pointed out by Pallas (Z. R. A., I, p 317), who seems chiefly to refer to the form of the tail, I can only state, that I am unable to see them.

A glance at the subjoined dimensions will convince us that the specimen is very small, not exceeding the average of the smaller Central European form. This fact is particularly interesting when we consider that it is in this very region that *H. leucocephalus* obtains its greatest development. The *H. albicilla* from Bering Island looks like a pygmy alongside its gigantic white-headed cousins.

"♂" ad.—U. S. Nat. Mus. No. 101199; *Grebnitski No.* 61. *Bering Island, November,* 1883.

Wing, 608^{mm}; tail-feathers, 258^{mm}; culmen from cere, 51^{mm}; radius of curvature from cere to tip, 27^{mm}; height of upper mandible at fore border of cere, 26^{mm}; external chord of hind claw, 39^{mm}.

97. Thalassoaëtus pelagicus (Pall.).

1826.—*Aquila pelagica* Pall., Zoogr. Ross. As., I, p. 343, pl. I.—Kittl., Kupfert., I, p. 3, tab. ii, fig. 1 (1832).—*Id.*, in Lütke, Voy. aut. Monde, Atlas, Part. hist. pl. xiii.—*Id.*, Denkw., I, p. 330; II, pl. ad p. 364 (1858).—Middend., Sibir. Reis., II, 2 (p. 125) (1853).—*Haliætus p.* Temm. & Schleg., Faun. Jap. Av. (p. 11, pl. iv) (1847).—Cassin, Illustr. Birds, p. 31, pl. vi (1854).—Schrenck, Reis. Amurl., I, p. 222 (1860).—Schleg., Mus. P. B. Aquilæ, p. 14 (1862).—Swinhoe, P. Z. S., 1863, p. 260.—*Id. ibid.*, 1871, p. 339.—*Id.*, Ibis, 1874, p. 150.—Homeyer, Journ f. Orn., 1868, p. 248.—Przewalski, Putesch. Ussuri, Suppl. (p. 52) (1870).—Finsch, Abh. Brem., Ver., III, 1872, p. 24.—Dall, Avif. Aleut. Isl. west Unal., p. 4 (1874).—David & Oust., Ois. Chine (p. 13).—Taczan., Journ. f. Orn., 1876, p. 190.—*Id.*, Bull. Soc. Zool. France, 1876, p. 120.—*Id.*, *ibid.*, 1883, p. 329.—*Id.*, Orn. Faun. Vost. Sibir., p. 8 (1877).—Blakist. & Pryer, Tr. As. Soc. Jap., VIII, 1880, p. 238.—*Iid.*, *ibid.*, X, 1882, p. 180.—Blakist., Chrysanthemum, April, 1883.—*Id.*, Amend, List B. Jap., p. 66 (1884).—Seebohm, P. Z. S., 1884, p. 409.—*Thalassoaëtus p.* Stejneger, Pr. U. S. Nat. Mus. 1883, p. 65; Auk, 1884, p. 82. —*Id.*, Naturen. 1884, p. 7, fig.—Dybowski, Bull. Soc. Zool. France, 1883, p. 351.
1830.—*Falco leucopterus* Temminck, Pl. Color., I, pl. 489.
1832. —*Falco imperator* Kittlitz, Kupfert., I, p. 3.
1858.—*Aquila ossifraga* Kittlitz, Denkwürd., II, pp. 366, 406 (*nec* Brünn., 1764).

As I have shown elsewhere (Pr. U. S. Nat. Mus., VI, 1883, p. 66, and this work under *Haliæetus leucocephalus*), Pallas was very much mistaken in giving Bering Island as the true habitat of this bird. This mistake arose from his having misunderstood Steller's description of the bald eagle as referable to *Th. pelagicus*. The habitat is especially the mainland of Kamtschatka, where it is abundant, but also all the countries bordering the Okotsk Sea.

On Bering Island it is only an occasional visitor, being chiefly an inland bird preferring the quiet rivers and lakes surrounded by dense forests. During my sojourn on the islands two individuals were reported as seen, one early in the spring, the other about the 8th of June, 1883. A specimen obtained by Mr. Grebnitski the year previous to my arrival was examined by me, and the measurements are embodied in the following—

Table of dimensions.

U. S. Nat. Mus. No.	Collector's No.	Sex and age.	Locality.	Date.	Total length.	Wing.	Tail-feathers.	Culmen, from cere.	Radius of curvature of bill from cere to tip.	Tarsus.	Middle toe without claw.	Height of bill at fore border of cere.	External chord of hind claw.	Graduation of tail.
				1883.	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*
92732	2057	♂ ad.	Petropaulski, Kamtschatka.	May 24	962	600	320	63	39	99	74	35	43	110
92733	2043	♂ ad.	....do...........	May 21	954	610	320	65	....	98	...	37	45	108
92731	2062	♀ ad.	....do...........	May 25	1042	648	320	70	44	102	....	40	48	130
92735	2185	ad.	.. do...........	June —	....	630	330	67	....	103	82	38	45	99
92736	2309	ad.	....do...........	July —	....	590	315	66	39	......	...	36	43	105
92737	2308	ad.	....do..........	July —	....	585	300	66	41	97	75	37	42	95
92734	2310	ad.	....do...........	July —	....	605	313	67	....	97	67	37	43	85
92738	2311	juv.	....do..........	July —	....	255	65	53	35	......	....	32	37	....
	Greb.	....	Bering Island.	....	"910"	630	340	68	41	......	....	37	44	....

No. 92732.—Tail beyond closed wings, 120^{mm}; stretch of wings, 2.220^{m}. Iris, cream color. Bills, cere, and naked eye-space, as also the feet, intense golden yellow, bill tending to orange, and without trace of dusky. Testes small. Not fat.

No. 92733.—Tail beyond closed wings, 115^{mm}; stretch of wings, 2.250^{m}. Iris pale cream color. Bill, cere, and naked eye-space orange yellow, slightly dusky at tip of upper mandible. Feet yellow, tarsus somewhat paler; claws horny, bluish gray. Testes small, not swollen. Not fat. Weight, 12 pounds.

No. 92731.—Tail beyond closed wings, 110^{mm}; stretch of wings, 2 360^{m}. Iris, yellowish cream color. Bill, cere, and naked space of face yellow, the bill somewhat tinged with orange. Feet bright golden yellow; claws horny whitish, blackish only along the back. A naked "breeding patch," 140 by 90^{mm}, on the anterior part of the belly. Ova very small, only a few being swollen, and measuring about 5^{mm}. Rather fat.

A most interesting specimen is No. 92738, a downy young, just assuming the first plumage, the feathers coming out copiously on head, upper neck, interscapular region, wings, breast, anal region, and tail. The predominant color of the feathers is a dull blackish brown, slightly lighter brownish on the middle of the feathers of the top of the head; the inner webs of the wing-coverts are lighter, some at the base whitish, secondaries and scapulars margined with lighter brown. The tail-feathers, of which only the tips are visible, are white near the end, mottled with blackish further up. The down covering the rest of the body is of a smoky brownish gray. It will be seen from the table of measurements that the bill is as big as that of a full grown *Haliæetus leucocephalus*, notwithstanding the fact that the knob at the tip of the upper mandible has not yet disappeared. The lores are naked, with only a few scant bristles.

During the first days of June, 1883, after I had left Petropaulski, one of the natives secured for me the contents of a nest and one of the parents, No. 92735. In the nest were two eggs containing nearly hatched young, and as the hunter accidentally broke one of the eggs, he only sent me the fœtus in alcohol. The down of the latter (No. 92990) is pure silky white all over.

98. Pandion haliætus (Lin.).

1758.—*Falco haliætus* Lin., S. N., 10 ed., I, p. 91.—Kittl., Denkw., II, p. 197 (1858).—*Accipiter h.* Pallas, Zoogr. Ross. As., I, p. 355 (1826).—*Pandion h.* Schrenck, Reis. Amurl., I, p. 227 (1860).—Swinhoe, Ibis, 1860, p. 46.—*Id.*, *ibid.*, 1861, p. 24.—*Id.*, *ibid.*, 1863, p. 209.—*Id.*, *ibid.*, 1865, p. 347.—*Id.*, *ibid.*, 1870, p. 86.—*Id.*, *ibid.*, 1874, p. 426.—*Id.*, P. Z. S., 1863, p. 260.—*Id.*, *ibid.*, 1871, p. 340.—Radde, Reis. Süd. Ost-Sibir., II (p. 97) (1863).—Przew., Putesch. Ussuri (p. 52) (1870).—Taczan., Journ. f. Orn., 1872, p. 346.—*Id.*, Bull. Soc. Zool. France, 1876, p. 121.—*Id.*, *ibid.*, 1882, p. 384.—*Id.*, Orn. Faun. Vost. Sibir., p. 9 (1877).—Blakist. & Pryer, Ibis, 1878, p. 247.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 238.—*Iid.*, *ibid.*, X, 1882, p. 181.—Blakist., Chrysanthemum, September, 1882, p. 427.—*Id.*, *ibid.*, January, 1883, p. 36.—*Id.*, Amend. List B. Jap., p. 66 (1884).—Bolau, Journ. f. Orn., 1882, p. 330.—Dybowski, Bull. Soc. Zool. France, 1883, p. 351.—Seebohm, Ibis, 1884, p. 183.

The Osprey, like the other raptores feeding on salmon, is very abundant in Kamtschatka. To the islands, however, this species only comes as an occasional visitor. A specimen was recorded, as seen on Bering Island, May 24, 1883, during my absence in Petropaulski, where, as will be seen from the list of specimens collected, on the same day I secured two specimens, it being then very numerous at the few open places on the rivers and along the coast.

It will be seen from the measurements given below that the eastern birds are not smaller than European examples. Two Japanese specimens in the collection are still larger, so that the existence of a smaller race, "*orientalis*," in Japan seems to be out of the question, as already remarked by Captain Blakiston.

With the Japanese specimens those collected by me agree very well as to color, the spots on the breast being even darker and larger, if anything, in the latter, and the shafts of the rectrices are brown at the lower end. They are consequently referable to the Old World typical *haliætus*, and very easily distinguishable from the North American *carolinensis*. Third primary in all the specimens is longer than the second.

In my specimens the iris was of a clear yellow without orange. Mr. Ridgway assures me that in the two specimens of the American bird (*carolinensis*) he has collected the irides were scarlet (cf. Hist. North Amer. B., III, p. 184, foot-note). I should like to be informed whether the Old World form at any age has a similarly colored iris.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Sex and age.	Locality.	Date.	Wing.	Tail-feathers.	Culmen from cere.	Tarsus.	Middle toe without claw.	Total length.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
92727	2051	♂ ad.	Petropaulski, Kamtschatka.	May 23, 1883	484	204	30	59	45	543
92728	2075	♂ ad.	......do	May 24, 1883	480	200	30	59	....	535
92730	2060	ad.	.....do	May 24, 1883	465	200	30	57	42	550
92729	2635	♀	Velutschka, Kamtschatka.	Sept. 21, 1883	490	218	34	58	46	......
101660	......	ad.	Petropaulski, Kamtschatka.	.... .., 1884	485	202	32	59	44	......

No. 92727.—Wings beyond tip of tail, 37mm. Iris bright yellow. Bill in front of nostrils black; at base, cere, and mouth grayish blue sharply contrasted with the black tip; naked skin above the eye somewhat lighter grayish blue; eye-ring blackish. Feet very light blue with a greenish tinge; anterior border of the distal scales of the toes, as also the claws, blackish.

Superfamily STRIGOIDEÆ.

Family STRIGIDÆ.

99. Asio accipitrinus (Pall.).

1771.—*Stryx accipitrina* Pall. Reise Russ. Reichs, I, p. 455 (*nec* Bechst.).—*Asio accipitrinus* Newton in Yarrell's Brit. Birds, 4 ed., I, p. 163 (1872).—Blakist. & Pryer, Ibis, 1878, p. 246.—*Iid.*, Trans. As. Soc. Jap., VIII, 1880, p. 236.—*Iid. ibid.*, X, 1882, p. 178.—Seebohm, Ibis, 1879, p. 41.—Nelson, Cruise Corwin, p. 75 (1883).—Blakist., Amend. List B. Jap., pp. 18, 65 (1884).—Turner, Auk, 1885, p. 157.—Murdoch, Auk, 1885, p. 201.

1772.—*Strix brachyotus* I. R. Forster, Phil. Trans., LXII, p. 384.—Midd., Sibir. Reise., II, 2 (p. 130) (1852).—Schrenck, Reise. Amurl., I, p. 246 (1860).—Radde, Reisen Süd. Ost-Sib., II (p. 122) (1863).—*Otus b.* Swinhoe, Ibis, 1861, pp. 26, 327.—*Id. ibid.*, 1863, p. 89.—*Id.*, P. Z. S., 1863, p. 262.—*Id*, *ibid.*, 1871, p. 344.—Whitely, Ibis, 1867, p. 195.

1791.—? *Strix palustris* Bechst., Gem. Naturg. Deutschl., II (p. 344).—*Brachyotus p.* Dybow. & Parvex, J. f. Orn., 1868, p. 331.—Taczan., J. f. Orn., 1872, p. 350.—*Id.*, *ibid.*, 1874, p. 334.—*Id.*, Bull. Soc. Zool France, 1876, p. 132.—*Id.*, Orn. Faun. Vost. Sibir., p. 18 (1877).—Dall., Notes Avif. Aleut. Isl. west Unal., p. 4 (1874).—Dybowski, Bull. Soc. Zool. France, 1883, p. 355.

1826.—*Stryx ægolius* Pall., Zoogr. Ross. As., I, p. 309.

1856.—*Brachyotus cassinii* Brewer, Proc. Boston Soc. Nat. Hist., 1856 (p. 321).—Dall & Bannist., Trans. Chic. Acad., I, 1869, p. 273.—Dall, Notes Avif. Aleut. Isl., Unal. eastw., p. 2 (1873).

This owl seems to be a resident, though not very numerous, and rather rare in winter. It was observed frequently in May and June, 1883, near the village on Bering Island, and the natives of Copper Island informed me that they use to see it in Pestschanij Valley, when, in August, they dig for the roots of the Saranna lily.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Sex and age.	Locality.	Date.	Wing.	Tail.	Wings beyond tip of tail.	Total lenght.
					mm.	*mm.*	*mm.*	*mm.*
92755	1759	♂ ad.	Bering Island	Nov. 25, 1882	312	148	......	363
92754	1831	....	......do	Dec. 30, 1882	......	......	......	352
92756	2120	♂ ad.	......do	June 3, 1883	320	*145	20	387

No. 92755.—Iris light yellow. Bill and cere horny black.
No. 92754.—Iris bright yellow.
No. 92756.—Iris bright yellow. Stomach contained remains of *Arvicola rutila*. Testes large, swollen.

100. Nyctea nyctea (Lin.).

1758.—*Strix nyctea* Lin., Syst. Nat., 10 ed., I, p. 93.—Pall. Zoogr. Ross. Asiat., I, p. 312 (1826).—Middend., Sibir. Reise, II, 2 (p. 130) (1853).—Schrenck, Reise. Amurl., I, p. 247 (1860).—Radde, Reisen Süden Ost-Sibir., II (p. 124) (1863).—*Surnia n.* Przew., Putesch. Ussur. (p. 52) (1870).—*Nyctea n.* Licht., Nom. Mus. Berol., p. 7 (1854).—Turner, Auk, 1885, p. 157.

1798.—*Strix nivea* Thunb., Sv. Vet. Acad. Förhandl., 1798 (p. 184).—*Nyctea n.*, Dybow. & Parvex, J. f. Orn., 1868, p. 331.—Taczan., J. f. Orn., 1872, p. 349.—*Id.*, *ibid.*, 1874, p. 334.—*Id.*, Bull. Soc. Zool. France, 1876, p. 129.—*Id.*, *ibid.*, 1883, p. 332.—*Id.*, Orn. Fauna. Vost. Sibir., p. 16 (1877).—Dall & Bann., Trans. Chic. Acad., I, 1869 (p. 273).—Dall, Avif. Aleut. Isl. Unal. eastw., p. 2 (1873).—Dybowski, Bull. Soc. Zool. France, 1883, p. 355.

1872.—*Nyctea scandiaca* Newt. in Yarr. Brit. Birds, ed. 4, I. p. 187.—Blakist. & Pryer, Trans. As. Soc. Japan, VIII, 1880, p. 235.—*Iid.*, *ibid.*, X, 1882, p. 177.—Bean, Pr. U. S. Nat. Mus., 1883, p. 161.—Nelson, Cruise Corwin, p. 76 (1883).—Blakist., Amend List B. Japan, p. 28 (1884).

The snowy owl is only of late getting to be numerous on Bering Island, and was a few years ago regarded as a rather rare bird, although it was known to breed in the interior, *e. g.*, in the Kamennij Valley. But since the introduction of the two kinds of *Muridæ*, *Mus musculus* and *Arvicola rutila*, especially the latter (see my "Contributions," &c., Pr. U. S. Nat. Mus., 1883, p. 88), with which the whole island now is literally swarming, the numbers of the owl have been gradually increasing, so that during the winter of 1882–'83 they were very common and a conspicuous feature in the landscape. I know of at least twenty-four individuals that were killed in the neighborhood of the village, and still they were as numerous at the end of the winter as when the cold weather set in. They made their first appearance on the hill round the village about the middle of November, and from that time they were a common sight on the pointed tops of the sand-dunes or among the hummocks of the tundra, hunting *Arvicola* in broad sunlight. A specification of the contents of the stomachs examined by me is given below. The birds themselves were excessively fat, caused by the rich and easy supply of food, their entrails being firmly wrapped up in a mass of tallow, while the whole body was covered with a thick layer of firm and whitish fat.

They remained in the neighborhood of the village until the beginning of May, on the 2d day of which three individuals were still to be seen. Most of them then retired to the higher mountains in the interior of the southern part, but a few pair bred not far from the sea shore. Thus, for instance, a pair was seen during the whole summer in the neighborhood of the great seal rookery; and on the 3d of September, 1883, a family of five individuals had taken posts close to the road between the rookery and the village.

On Copper Island, where they only occur occasionally during the cold season, they were as rare during the winter 1882–'83 as ever. On that island no mice are found.

From the above it would seem as if the increase of the *Arvicola* has been the direct cause of the increase of the owl, consequently, that the "increase in the procreative powers is owing to the abundant supply of food," and that it is not "to be traced *rather* to the cause (whatever it be) which renders the small rodents *in that very year* so much more prolific than common" (COLLETT, Orn. Rem., Vid. Selsk. Förh. Christiania, 1872, p. 224, Extr., p. 38; *Id.*, Nyt. Mag. Natur., 1877, p. 169). I may add here that none, even the oldest, of the residents can remember ever to have seen the snowy owl so plentiful as it occurred last winter.

The specimens are all rather heavily barred, even the lightest male being very much so.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex.	Weight.	Total length.	Tail beyond wings.	Wing.	Tail-feather.
					lbs.	*mm.*	*mm.*	*mm.*	*mm.*
92742	1742	Bering Island	Nov. 22, 1882	♂	......	568	......	410	215
92744	1754	......do	Nov. 26, 1882	♂	5½	578	......	408	210
92745	1857	......do	Jan. 7. 1883	♂	4½	560	54	415	218
92751	1870	......do	Jan. 15, 1883	♂	4¾	532	35	435	216
92747	1899	......do	Feb. 5, 1883	♂	4¾	557	69	405	204
92746	1928	......do	Feb. 21, 1883	♂	4⅝	577	65	428	215
92748	1766	......do	Nov. 30, 1882	♀	6	628	......	468	245
92752	1812	......do	Dec. 21, 1882	♀	5½	609	......	457	250
92750	1863	......do	Jan. 9, 1883	♀	5½	597	45	450	228
92753	1864	......do	Jan. 9, 1883	♀	5¾	590	55	460	233
92749	1865	......do	Jan. 9, 1883	♀	5¾	610	41	453	240
92743	1833	......do	Jan. 2, 1883	....	4½	555	50	417	215

No. 92742.—Iris bright yellow. Bill and claws horny blackish blue. Ear-opening 22 by 18 mm. In stomach six *Arvicolæ*; no trace of feathers.

No. 92744.—Stomach contained four *Arvicolæ*; no feathers.

No, 92745.—In stomach two *Arvicolæ*, and no feathers.

No. 92747.—In stomach two *Arvicolæ*.

No. 92746.—Stomach contained several *Arvicolæ*.

No. 92748.—Stomach crammed with *Arvicolæ*; no feathers.

No. 92752.—Stomach completely empty.

No. 92750.—Stomach contained feathers and a few fragments of bones apparently of an lamellirostral bird.

No. 92753.—In the stomach remains of *Arvicolæ*.

No. 92749.—Contained one *Arvicolæ*.

No. 92743.—Had two *Arvicolæ* in the stomach.

From the above list of the contents of the stomachs, it would seem as if *Arvicola* was almost their only food. But it is but fair to state that I have seen this owl chase sea ducks, especially *Histrionicus histrionicus*, out at the reef, very much in the same manner as does the falcon. On January 7, 1883, I found on the beach the remains of a *Harelda hyemalis*, eaten by a snowy owl. The footprints in the snow were very recognizable from the impression of the feathers of the toes and by the direction of the inner toe at a right angle with the other ones. It may be that even the snowy owl sometimes gets tired of too uniform a diet.

The Russian name by which the snowy owl is known by the natives on the islands is "*Sitsch*," which, according to Pallas, in Russia is applied to *Nyctala tengmalmi*.

ORDER PICARIÆ.

Superfamily CUCULOIDEÆ.

Family CUCULIDÆ.

101. Cuculus canorus telephonus (HEINE).

1826.—? *Cuculus borealis* PALL., Zoogr. Ross. As., I, p. 442 (*part*).
1861.—*Cuculus striatus* SWINH., Ibis, 1861, p. 259 (*part; nec* DRAP.).
1862.—? *Cuculus swinhoei* CAB., Mus. Hein., IV, i, p. 39 (*part, nom. nud.*).
1863.—*Cuculus telephonus* HEINE, Journ. f. Orn., 1863, p. 352.
1871.—*Cuculus canorus* SWINH., P. Z. S., 1871, p. 395.—BLAKIST. & PRYER, Ibis, 1878, p. 227.—*Iid.*, Trans. As. Soc. Japan, VIII, 1880, p. 205.—*Iid.*, *ibid.*, X, 1882, p. 130.
1872.—? *Cuculus canorinus* CAB., J. f. Orn., 1872, p. 236.—TACZAN., Bull. Soc. Zool. France, 1876, p. 237.
1875.—*Cuculus canorinus* SWINHOE, Ibis, 1875, p. 451.—STEJNEGER, Naturen, 1882, p. 182.—*Id.*, Pr. U. S. Nat. Mus., 1883, p. 71 (*part*).—TACZAN., Bull. Soc. Zool. France, 1882, p. 395.—DYBOWSKI, Bull. Soc. Zool. France, 1883, p. 368.

Most of the English writers agree that they have not been able to separate the Eastern Asiatic bird from *Cuculus canorus* of Europe, while Cabanis, *l. c.*, expressly states as his view, that the latter does not occur in Eastern Asia at all.

The birds which I have collected are easily enough distinguishable from European specimens, and it seems to be the rule that the eastern bird has finer and narrower, dark bars on the lower surface; but as intergradation has been satisfactorily proved, the eastern form can only be designated as a race.

I am rather doubtful whether Cabanis's *canorinus* of 1872 (from Baical), and the birds (from Eastern Siberia generally), designated by Taczanowski by the same name, really belong to our race. The latter author (*l. c.*) describes his specimens as differing from the European form "par les bandes des parties inférieures du corps plus fines et *plus nombreuses*, et les taches blanches sur les rectrices *plus petites*, elles *manquent complètement sur les médianes*, sur les suivantes elles sont à peine distinctes; les subcaudales sont *plus rayées* de foncé." Now it is the feature of my birds, that, although the dark bars underneath are finer and narrower, they are *by no means more numerous;* the whitish spots on the rectrices are *rather larger*, and are well marked, even on the middle pair, and the subcaudales are not more, but *less*, *streaked* than in the European specimens. But there is one reason more why I cannot apply the name *canorinus* to the present form, viz, that the bird thus named is apparently different from the species to which Cabanis in 1862 originally applied the name. The *canorinus* of Museum Heineanum (said to be the same as Müller's *C. canoroides*) is described as being somewhat smaller than *canorus*, besides differing from it by "*subalaribus minus crebre fasciolatis mediis fere unicoloribus tanquam fasciam longitudinalem albidam formantibus.*" Now Taczanowski expressly states that his birds are of the same size as those from Europe, and does not mention the peculiar coloration of the under wing-coverts. In my birds, at least, these feathers certainly are narrowly and uniformly barred. It would almost seem from the description of Taczanowski, quoted above, that the Siberian bird forms a separate race, the proper name of which would be *Cuculus canorus borealis* (PALL.).*

As to the name applied by me to the Kamtschatkan bird I have to offer the following remarks: In the Ibis for 1861 Mr. Swinhoe described a *Cuculus* from Talien Bay as *striatus* DRAP., stating at the same time that his birds were larger, and had a weaker bill than the Indian specimens. These birds he afterwards recognized as erroneously identified, referring them then partly to *C. canorus* (*Cf.* Ibis, 1863, p. 395). In the mean time Cabanis and Heine had proposed the name *C. swinhoei* for the same specimens, under the impression, however, that they belonged to *striatus* proper, or, at least, *striatus* of Jerdon and of Cabanis, as a race. But it seems evident from the synonymy (P. Z. S., 1871, p. 395), that Swinhoe, even in 1871, by *striatus* understood a bird widely different from that of the two authors quoted above, and partly identical with the so-called *C. himalayanus* Jerdon and *C. kelungensis*. Nevertheless, it may be safer to reject the name given by Cabanis and Heine, since it is based upon no description or already described species, and also since it seems that the authors insist upon comparing *C. swinhoei* with *striatus* or *micropterus* (cf. J. f. Orn., 1868, p. 355). The next

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*The only question is, whether it is admissible to restrict Pallas's name thus, as it was only partly given to this bird: "*Per universam Rossiam et Sibiriam, etiam in borealibus* * * * *etiam in Camtschatca adest,* * * * *Nusquam copiosiorem audivi, quam in Dauuria.*"

name in time, Heine's *C. telephonus*, seems perfectly pertinent, as it is based upon a skin from Japan, being "subtus fasciis tenuioribus ac paucioribus quam *C. canori* fasciatus.".

The cuckoo is rather numerous in the neighborhood of Petropaulski, where in 1882 I heard its well-known note as late as July 11. In 1883 it had not arrived when I left the town on the 28th of May. Visiting the same place again in the middle of September I found that they had already departed.

I could not detect the slightest difference in the voice or habits from those of the common European form.

On treeless Bering Island this bird only occasionally makes its appearance during the migrations; although apparently especially adapted to live among trees, it is by no means absolutely confined to places where such occur, for I have several times found its western representative, during the latter part of June, on the high plateaus of the Norwegian mountains above the limit of trees, where it could only deposit its eggs in the nests of the ground-breeding *Anthus pratensis* and *Saxicola oenanthe.*

Three exemplars were shot the year before I visited the island, and on June 13, 1882, I got a single male, which was shot at Bolschaja Reschka, on the northern shore, while picking up *Gammaridæ* between the bowlders of the beach. The stomach was found crammed with these crustaceans, a rather strange food for a cuckoo! I had, however, the same experience with a specimen of the next species.

A native of Germany, who had been residing on Copper Island for about ten years, stated that he had heard the cuckoo's voice there once.

List of specimens.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Exposed culmen.
					mm.	*mm.*	*mm.*	*mm.*
89056	1201	Bolschaja Reschka, Bering Island	June 13, 1882	♂ ad.	349	225	175	24
89145	1243	Petropaulski, Kamtschatka............	June 30, 1882	♂ ad.	350	226	174	24

No. 89056.—Iris yellow. Bill horny black; lower mandible, bluish in the middle, and yellow towards the base; angle of mouth yellow, as also the naked ring round the eye; inside of mouth orange-red. Feet deep yellow.

No. 89145.—In the stomach was found remains of three or four specimens of a *Bombus*.

In order to show that there is no appreciable difference in dimensions between the two forms, except perhaps in the size of the bill, which seems to be larger in the eastern bird, I submit the following

Table of dimensions.

U. S. Nat. Mus. No.	Sex and age.	Locality.	Date.	Wing.	Tail-feathers.	Exposed culmen.	Remarks.
				mm.	*mm.*	*mm.*	
9203	♂ ad.	Germany	May —, 1851	219	162	20	
56708	♂ ad.	......do		227	162	21	
18933	♂ ad.	France		221	176	22	
96532	♂ ad.	England		218	169	20	
56709	♀ jun.	Germany		204	162	19	
24265		......do		210	164	......	Hepatic phase.

102. Cuculus peninsulæ sp. n.

Diagnosis.—Allied to *Cuculus kelungensis* SWINH., from Japan, but the gray color much lighter, the under surface, including the under tail-coverts, only very faintly tinged with buff; the under wing-coverts nearly white, with faint and few gray cross-bars, and the inner webs of the primaries with more numerous, broader, white cross-spots, and more white at the base.

Dimensions: Total length, 318^{mm}; wing, 197^{mm}; tail-feathers, 144^{mm}.

Type: ♀, U. S. Nat. Mus. No. 89128.

Habitat: Kamtschatka; accidental in the Commander Islands.

Synonymy: 1882.—*Cuculus indicus* TACZANOWSKI, Bull. Soc. Zool. France, 1882, p. 395 (*nec* BLYTH); DYBOWSKI, Bull. Soc. Zool. France, 1883, p. 368.
1883.—*Cuculus canorinus* STEJNEGER, Pr. U. S. Nat. Mus., VI, 1883, p. 182 (*part; nec* CAB.).

Among the stragglers from the mainland to the Commander Islands I got two female cuckoos, which are quite different from the form described on a previous page as *Cuculus canorus telephonus*. One is in the usual gray plumage, while the other represents the hepatic or rufous phase. In those points in which this form differs from the other allies the two skins agree perfectly, leaving no doubt whatever about their belonging to the same species.

Comparing them with the form mentioned above, I find them to differ in the following points:

1. They are considerably smaller.

2. The under wing-coverts are quite differently marked, the middle and smaller ones being uniform white, without bars, while the inner

and larger arm-coverts are marked with some few and distant cross-bars, against the uniform and narrow barring of *canorus*.

3. Only the six first primaries have white cross-bars on their inner webs, the white bases of the following quills forming a distinct and large white speculum on the under surface of the wing. In the other form eight primaries at least are distinctly barred, the white speculum being much less pronounced. Besides, the white bars are narrower and more numerous than in the bird in question; the bars or spots, *e. g.*, on the inner web of the first primary are only five in the latter, while in the former their number is seven, at least.

4. The dark cross bars of the under surface are more blackish, broader, more distant, and, consequently, fewer.

5. The spots on the tail-feathers are rather larger and more distinct.

The two first points agree with Cabanis's description of *canorinus*, 1862 (the alleged *canoroides* MÜLL.), but his "*subtus fasciis ut in* C. canoro *crebrioribus angustis*," compared with point 4, as above, prevents them from being united. It may be that they will turn out to be races of the same species, but at present a decision is hardly possible. It must be borne in mind that I consider *C. canorinus* Cabanis of 1862 and *C. canorinus* Cabanis of 1872 to be two different birds.

This is the same species which Taczanowski and Dybowski record from Kamtschatka as "*Cuculus indicus* Cab.," but I need only quote a few words from Cabanis's description (Mus. Hein., IV, i, p. 35), to show that his *indicus* does not belong here, as he describes it as "subtus fasciis aliquantulum angustioribus seu tenuioribus," and "tectricum subalarium fasciolis ut in C. canoro tenuissimis creberrimis." This is certainly nothing but the Indian *Cuculus canorus*, which, if really separable from the European bird, should stand as *Cuculus canorus indicus*, by which name it was originally designated by Blyth (Jour. As. Soc. Beng., 1846 (p. 19)). In fact, the name *indicus* may perhaps finally be found to belong to the foregoing species (*C. telephonus*), from which it seems to differ chiefly by a somewhat smaller size, and a weaker and shorter bill.

Cuculus peninsulæ comes nearest to the bird which is recorded from Japan as *C. himalayanus*, but which I think should properly stand as *C. kelungensis* Swinhoe, or perhaps *C. saturatus kelungensis*. The chief differences have been mentioned in the diagnosis, the two forms being easily distinguished by comparing the under side of the wing, which on the whole is much lighter in the Kamtschatkan bird. The difference in the number of white bars on the primaries is apparently not so great, since in *C. peninsulæ* the lower ones are fused together, having entirely swallowed up the intervening black spaces; the white spots, in this form, are much broader than the black separating them, while, in the Japanese birds, the proportion between the white and black is exactly the reverse. In dimensions, in the broad and distant bars on the lower surface, and in the scanty barring on the under wing-coverts, the two forms agree very well.

The rufous specimen (No. 92699) has the bars underneath still broader and blacker; the upper surface is more deeply hazel than the corresponding stage of *C. canorus*, the rump being quite chestnut, strongly and broadly barred with black; the brown color descends on the sides of head and neck, and strongly tinges the throat.

As already stated, two stragglers of this species were shot by me on Copper Island, one in 1882 the other in 1883. Both were met on the eastern shore near the beach, the former at the main village, the latter, which was in the hepatic stage of plumage, a little north of the settlement Karabelnij. No note was heard.

Dimensions.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Exposed culmen.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
89128	1213	Copper Island, main village	June 19, 1882	♀ ad.	318	......	197	144	22
92699	2215	Copper Island, Sabatschi Mys, Karabelnij.	July 1, 1883	♀	319	45	188	141	......

No. 89128 (Gray plumage).—Iris, outer ring cream colored, inner grayish brown. Naked eye-ring bright yellow. Bill horny black; basal third of upper mandible (except nasal tubes) and two-thirds of the lower are yellowish; angle of mouth, and lower jaw along the chin angle, orange yellow. Inside of mouth pale orange-red. Feet light cadmium yellow. Contents of stomach, *Gammaridæ!*

No. 92699 (Hepatic plumage).—Iris light cream colored, inner ring tinged with brownish gray, outer one slightly so with greenish. Bill blackish bluish gray, lighter on lower mandible; tubercle in the middle of nostrils olive-yellow; angle of mouth and base of lower jaw orange-yellow. Interior of mouth delicate orange-red. Naked eye-ring bright golden yellow. Feet orange-yellow, claw of outer toe dusky. Eggs small.

In Petropaulski I was told of a cuckoo said to be distinguishable from the common one especially by its quite different voice. This is the present species, but I never met with it in Kamtschatka, where it has been collected by Dybowski.*

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* *Cf*, also KITTLITZ, Denkwürd, II, p. 198: "Das an unsern Wiedehopf erinnernde Geschrei, das man hier dem Kuckuck zuschreibt, und das auch wirklich neben jenem andern [the common cry of the European cuckoo] von ihm herzurühren scheint."

Superfamily PICOIDEÆ.

Family PICIDÆ.

103.—Dryobates purus Stejneger.

1858.—*Picus major* Kittl., Denkw., I, p. 321 (*nec* Lin.).—Taczan., Bull. Soc. Zool. France, 1882, p. 395.

1883.—*Picus major kamtschaticus* Dybowski, Bull. Soc. Zool. France, 1883, p. 368 (nec *Picus kamtschatkensis*, Bp.)

1884.—*Dendrocopos purus* Stejneger, Auk, 1884, p. 35.

This species is closely related to *D. major* (Lin.), but differs in having the breast and upper abdomen very pure white, the white of the lateral rectrices without, or almost without, dark markings, and possessing a white spot on the outer web of each of the longest primaries near the tip.

The greater purity of the white of the lower surface and the greater extent of the same color on the lateral tail-feathers distinguish this species easily from its allies. In the description of *D. cissa* Pallas expressly says that the lateral rectrices are white "nigro transversim variegatæ" and "pectore sordescente." Specimens of *D. major* from Central Europe, the only ones at present accessible to me, have the lateral tail-feathers strongly barred, and lack the white spot near the tips of the outer web of the longest primaries. The markings are, however, also found in *Dryobates japonicus* (Seeb.), but the Japanese bird has a very dark lower surface, and transverse markings on all the lateral tail-feathers; besides, the Kamtschatkan form has a stouter and longer bill.

Dryobates purus is especially conspicuous for the uniform white color on the lateral tail-feathers. In two of the specimens are seen some traces of transverse bars on one or both of the two external feathers, but no traces of similar bars or spots are found on the two following pairs.

The dimensions may be seen from the following

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Exposed culmen.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
92702*	2019	Saranna, Bering Island	May 8, 1883	♂ ad.	253	45	147	86	......
92701*	2024	Ladiginsk, Bering Island	May 9, 1883	♂ ad.	241	43	139	86	28
92703*	1700	Severnij, Bering Island	Oct. 26, 1882	♀ ad.	251	......	132	86	30

*Types of *Dendrocopos purus*.

No. 2019, ♂.—Iris crimson. Bill plumbeous, darker above; lower mandible below at base whitish. Feet gray with an olive tinge, not at all bluish. Rather fat. In the stomach remains of a coleopterous insect.

No. 2024, ♂.—Colors as the foregoing. Not fat.

No. 1700, ♀.—Iris carmin-red. Bill bluish gray. Feet same color, only a little darker. Stomach crammed with the white large larvæ of the flesh-fly. "So fat as a woodpecker can possibly be."

The following table of dimensions is added for comparison with the allied forms:

U. S. Nat. Mus. No.	Names of species.	Locality.	Collector's name.	When collected.	Sex and age.	Wing.	Tail-feathers.	Exposed culmen.
						mm.	mm.	mm.
88703	*Dryobates japonicus*	Japan	Jouy	July 4, 1882	♂ ad.	131	76	27
91328	do	do	do	Nov. 7, 1882	♂ ad.	131	79	26
91329	do	do	do	Nov. 20, 1882	♂ ad.	133	83	25
91330	do	do	do	Dec. 4, 1882	♀ ad.	129	81	24
91331	do	do	do	Dec. 12, 1882	♀ ad.	131	83	23
91332	do	do	do	Dec. 12, 1882	♀ ad.	132	85	25
18939	*D. major*	France	Drouet		♂ ad.	147	92	25
18940	do	do	do		♀ ad.	141	89	24

My surprise was very great when, on the 26th of October, 1882, I held in my hand the female of this elegant bird, shot on the killing-ground at the northern seal rookery on Bering Island. It had been seen in the neighborhood for about fourteen days feeding on the enormous masses of the white larvæ of the flesh-fly, with which the whole ground swarms at this season for more than a square mile. In spring again I obtained two more specimens, two males, from different places on the northern part of the island. These birds of the forest are, of course, only stragglers from Kamtschatka, where the species is not uncommon. In the latter part of May and again in September, 1883, I observed several individuals in the neighborhood of Petropaulski.

104. Dryobates immaculatus STEJNEGER.

1858.—*Picus minor* KITTL., Denkw., I, p. 321 (*nec* LINN).

1882.—*Picus kamtschatkensis* TACZAN., Bull. Soc. Zool. France, 1882, p. 396 (*nec* BP.).—DYBOW., Bull. Soc. Zool. France, 1883, p. 368.

1883.—*Dendrocopos immaculatus* STEJNEGER, Pr. Biol. Soc. Wash., II, April 10, 1884, p. 98.

On a previous occasion I have briefly indicated that the *Picus kamtschatchensis* BP. is not the Kamtschatkan bird at all. As will be shown more elaborately below, the form named thus by Bonaparte in 1854 is only the well-known Siberian bird, Pallas's *pipra*, of which the name, given by Bonaparte, is but a synonym.

The type of his species was a bird "tué le 28 septembre 1853, aux environs d'Okhotsk, sur le bord de la mer asiatique de ce nom," and the locality, Kamtschatka, is only a guess caused by the very erroneous idea that the birds of the peninsula are identical with those occurring on the other side of the wide Okotsk Sea, the same idea that caused the determination of *Parus baicalensis* as *kamtschatkensis*. The description and plate of Malherbe from the type show furthermore, beyond possibility of doubt, that his bird is identical with the Siberian form, having "transverse cordiform spots of a brownish fuliginous color on the under tail-coverts," and the plate shows distinctly two dark cross-bars on the outer tail-feathers, and one on each of the two following pairs, together with a well-marked black subocular stripe. A comparison with Seebohm's description (Ibis, 1880, p. 181) makes the identity apparent. He says: "The under tail coverts are slightly streaked with black; the outside tail-feathers have two rudimentary cross-bars." It would almost seem as if the type in Malherbe's possession had those features even more distinct than the bird described by Mr. Seebohm. Pallas's words agree in the same manner: "*Crisso punctato*" and "*subcaudales guttulis cordatis nigricantibus*."

The bird which I procured in Petropaulski has no trace of spots on the crissum or the under tail-coverts. On the outermost pair of rectrices, which are white to the very base, is one single rudimentary and narrow cross-bar near the tip, while the two following pairs have none, a just perceptible spot on the margin of the inner webs indicating the place where the bar is situated in allied forms. The fourth pair has a white tip about 5^{mm} broad, beginning on the outer web, about 13^{mm} from the tip. From the base of the lower mandible, in a line with the direction of the bill, the feathers have dark gray bases and pure white tips, thereby forming a rather obsolete grayish malar stripe, mottled with white, scarcely connected behind with the large black patch on the side of the neck. The white space behind the brownish ocular patch is so nearly connected with that on the other side as to almost form a continuous white band across the upper neck. Back white, unbarred. The *whole* lower surface pure white without the *slightest trace* of stripes or spots. The white cross-bars on the inner secondaries are not particularly broad, being only 4^{mm}, and the rounded white spots on the inner webs of the primaries are quite separate and not confluent along the inner margin of the quill.

This beautiful bird needs no further comparison with the allied forms than is given above. The Japanese form seems to be related to it in a similar way as is *Dryobates minor hortorum* (Brm., 1831) (=*striolatus* MACG., 1840) to the Scandinavian true *D. minor* (Lin.) (=*D. minor borealis* SUNDEV.), and is probably indistinguishable from *D. minor pipra* (Pall.) from Siberia. Should intergradation with the Siberian form really occur, the question will arise whether our new form should stand as *D. minor immaculatus* or *D. pipra immaculatus*. This is a point of the trinominal nomenclature which is not yet decided upon by the leading trinominalists.

v. Kittlitz (*l. c.*) states that "*Picus minor* ist hier [Petropaulski, latter part of September] nicht selten, jedenfalls häufiger als der ebenfalls hier einzeln vorkommende *Picus major*" (=my *P. purus*), which is contrary to my experience, as the specimen which I collected was the only one I saw during my stay in Petropaulski. It was shot on the wooded peninsula sheltering the harbor, where it flew restlessly from one birch (*Betula ermani*) to another.

The dimensions of this specimen are:

♂ *ad.—U. S. Nat. Mus. No.* 92700, *L. Stejneger No.* 2757: *Petropaulski, October* 9, 1883.

Total length, 167^{mm}; tail beyond wings, 24^{mm}; wing, 97^{mm}; tail-feathers, 61^{mm}; exposed culmen, 18^{mm}.

Remarks.—Iris bright hazel. Bill pure gray, darker above; a narrow dark stripe along the gonys. Feet gray, with a light greenish tinge.

ORDER PASSERES.

Family ALAUDIDÆ.

105. Alauda blakistoni Stejneger.

1826.—*Alauda coelipeta* Pall., Zoogr. Ross. Asiat., I, p. 524 (*part*).
1858.—*Alauda arvensis* Kittl., Denkw., II, p. 198 (*nec* Lin.).—Taczan., Bull. Soc. Zool. France, 1882, p. 389.—Dybow., Bull. Soc. Zool. France, 1883, p. 361.
1882.—*Alauda cantarella* Blakist. & Pryer, Trans. As. Soc. Japan, X, 1882, p. 166 (*nec* Bp.).—*Alauda* —— ? Blakist., Amend. List B. Jap., p. 59 (1884).
1884.—*Alauda* sp. Stejneger, Naturen, 1884, p. 5.
1884.—*Alauda blakistoni* Stejneger, Pr. Biol. Soc. Washingt., II, p. 98.

One needs almost apologize when creating a new species among the Palæarctic *Alaudæ*. The group is a most perplexing one, and considerable confusion exists in regard to the East Asiatic forms. But it is thought that the naming of the present bird will tend to clear the confusion which has arisen from the untimely zeal of ornithologists in uniting distinct forms on insufficient evidence. I cannot refer the specimens from Kamtschatka to any form known to me, and I will not be found guilty of applying to them a name which I do not consider properly belonging to them. Taking the name of a form which seems to agree best, but yet not exactly, would only add to the confusion. In this connection it may be proper to remark that the "reducing" and "uniting" of species is often made upon inspection of a single specimen, but this is a proceeding which, in many cases, proves to be even more unsafe than to base a new species on a single type.

In a previous paper (Pr. U. S. Nat. Mus., 1883, p. 68) I called attention to four larks in the first instalment of my collection, forwarded to the United States National Museum in 1882. Since that time more material from Eastern Asia has accumulated, enabling me to make a fair comparison of the allied forms.

The ten specimens collected by me show much less variation in color and dimensions than is usual in larks. Having at hand a series of typical *Alauda japonica* from Japan, and *arvensis* from Europe, besides specimens of *coelivox* from China, *intermedia* Swinh. from Vladivostok, and *cantarella* from Palestine, I have little hesitation in pronouncing the Kamtschatkan form different. Compared with European specimens its average size agrees with the larger ones of the latter, while in color it comes much nearer to the Japanese species, the rusty tinge of which is rather conspicuous. My birds show, however, two very peculiar features, viz, dark blackish brown scapulars and interscapulars, the lighter edges being conspicuous on the inner webs, and the rusty colored hind neck only dotted with small dark spots, forming a light color between the strongly-marked pileum and the dark color of the upper back; besides, the spots on the fore neck and upper breast are smaller and darker, and, consequently, more distinct. The bill is somewhat longer and stouter than in *japonica*.

The specimens from Vladivostok collected by Mr. Jouy and Dr. Dale are paler and smaller, thus being referable to *A. intermedia* SWINH. They seem to occupy the same position to the Kamtschatkan species, as *A. cantarella* BP. (*nec* SWINH., *nec* TACZAN., quæ *intermedia*) does to the typical *arvensis*. The birds from Vladivostok have the dark color of the scapular region more confluent and not so distinctly streaked as *cantarella*. *A. coelivox* is sufficiently distinct by its considerable smaller size.

Lists of measurements of the material examined is added for comparison.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Exposed culmen.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
89027	1020	Bering Island	May 9, 1882	♂ ad.	186	......	114	76	12
89026	1117	......do	May 30, 1882	♂ ad.	187	......	119	74	14
89153	1242	Petropaulski	June 30, 1882	♂ ad.	183	......	112	70	13
89154	1249	......do	July 4, 1882	♂ ad.	173	......	116	68	13
92658	1995	Bering Island	Apr. 19, 1883	♂ ad.	193	......	115	69	14
92661	2040	Petropaulski	May 19, 1883	♂ ad.	197	26	118	73	13
92659	2049	......do	May 19, 1883	♂ ad.	187	24	115	71	12
92657	2079	Bering Island	May 13, 1883	(♂) ad.	......	......	119	75	13
92662	2041	Petropaulski	May 19, 1883	♀ ad.	187	29	107	70	12
92660	2046	......do	May 20, 1883	♀ ad.	185	22	110	69	12
		Average measurements of eight males			187	......	116	72	13
		Average measurements of two females			186	......	109	70	12

No. 89027.—Iris dark brown. Feet light reddish brown; tarsal joint with a strong tinge of dark gray; toes below livid.

No. 89026.—Iris hazel.

No. 89153.—Bill brownish flesh color; tip, culmen, and sides of upper mandible blackish brown. Feet pale reddish brown; tarsal joint dark grayish; nails blackish gray.

No. 92658.—Iris dark hazel. Bill, upper mandible dark-brownish gray; along tomia and whole lower mandible pale yellowish gray. Testes large, swollen.

No. 92661.—Iris brown. Bill horny blackish brown; tomia and back of lower mandible paler, grayish. Feet reddish gray; joints darker gray; below livid. Testes large, swollen. Stomach containing seeds.

No. 92662.—Iris, bill, and feet as foregoing. Largest egg 2^{mm} in diameter.

Tables of dimensions.

A.—ALAUDA JAPONICA.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Wing.	Tail-feathers.	Exposed culmen.
						mm.	*mm.*	*mm.*
91464	Jouy	911	Yokohama	Jan. 3, 1883	♂ ad.	106	63	11
91550	....do	999	Yubuts, Yezo	Sept. 15, 1882	♂ ad.	99	64	12
91551	....do	1000	Sapporo, Yezo	June 23, 1882	♂ ad.	104	66	12
91465	... do	912	Yokohama	Jan. 3, 1883	♀ ad.	92	58	13
91466	....do	913	......do	Jan. 3, 1883	♀ ad.	98	65	12
91467	....do	914	......do	Jan. 3, 1883	♀ ad.	93	58	11
	Average measurements of three males					103	64	12
	Average measurements of three females					94	60	12

B.—ALAUDA INTERMEDIA.

86159	Jouy & Dale	222	Vladivostok	June 15, 1881	♂ ad.	106	67	11
86160	....do	223	......do	June 27, 1881	♂ ad.	107	69	12
	Average measurements of two males					106	68	12

C.—ALAUDA CŒLIVOX.

37788	Swinhoe	......	Formosa	Mar. —, 1862	....	91	57	14
86112	Jouy & Dale	175	Hong-Kong	Oct. 9, 1881	♂ ad.	92	56	13

D.—ALAUDA ARVENSIS.

18719	....	......	Europe	....	....	110	72	12
23419	Lazar	......	Hungary, Europe	—— —, 1860	....	104	63	11
37766	Tristram	......	Sidon, Syria	Dec. 1, 1863	♀	106	64	11

E.—ALAUDA CANTARELLA ?.

37807	Tristram	723	Beersheba, Palestine	Feb. 4, 1864	♀	107	68	10

The skylark is one of the first spring arrivals among the migrating birds of Kamtschatka, often making its appearance long before the snow has melted away from the ground. In 1883 the first specimen on Bering Island was shot on the 19th of April, while sitting on the beach picking up small crustaceans, and when in the middle of May I arrived at Petropaulski the larks were plentiful on the few bare spots from whence the males rose on quivering wing, singing their "wild, joyous notes," fascinating the listener by the cheerfulness if not by the beauty of their music, notwithstanding the 5 to 6 feet depth of snow on the ground.

As already stated, the lark occurs also on Bering Island, where a few may be heard during the summer between the village and Ladiginsk, among the sand dunes covered with a luxuriant growth of *Elymus*.

Family CORVIDÆ.

106. Corvus behringianus (Dyb.).

1826.—*Corvus corax* Pall., Zoogr. Ross. As., I, p. 380 (*part*).
1883.—*Corvus corax behringianus* Dybowski, Bull. Soc. Zool. France, 1883, p. 363.
1884.—*Corvus grebnitskii* Stejneger, Pr. Biol. Soc. Washingt., II, p. 97.

I have not been able to detect any difference between my specimens and those from Central Europe in respect to dimensions, size, or shape of the bill, size of the nasal bristles, or luster of the plumage.

The only distinction I can see is the different wing formula, which in all specimens examined by me is constant. Going over the literature, besides, I find it unanimously stated that in the European bird the third and the fourth primaries are the longest, the third being decidedly longer than the fifth, while in all my ravens from the Commander Islands the fourth and the fifth are the longest, the latter being a trifle shorter than the former, but considerably longer than the third, the difference in the two forms consequently being very well marked. At the same time the first primary seems to be reduced in length, as it falls between the eighth and the ninth, in one instance even between the ninth and tenth, while I think the rule in the European species is that it falls between the seventh and the eighth.

These differences may have originated in the insular habitat of the present form, but whatever may have been the cause, the difference is now established; and it does not invalidate the distinctness of the form that we are able to point out its probable cause. If the suggested explanation be true, it would be a most remarkable fact, showing the effect of insular isolation even on so powerful a flyer as the raven. As we here have a case of "breeding in and in" within a small stock, it is interesting to observe that it has not had the same influence as on the Fær Islands, where it seems to have produced a race of partial albinos.

A comparison with the large series of skins of *C. corax carnivorus* from North America, especially with those from Alaska, has not been neglected, the result being that the Commander Islands birds are distinguished from the American race in the same manner as are the European specimens, besides differing in the wing formula, which is alike in the American and the European forms. In all the specimens examined by me the third primary was equal to or longer than the fifth, and never shorter.

Since the above was written I have learned that Dr. Dybowski has named the bird from Bering Island *Corvus corax behringianus.* As the name given by him has a priority of about two months it must stand, although being rather unfitting, as the bird is more common on Copper Island than on Bering Island. I see no reason for regarding it as only a subspecies, as no intergradation is known, or is likely to occur.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Culmen from frontal feathers.	Graduation of tail.
					mm.	mm.	mm.	mm.	mm.	mm.
92757	1736	Bering Island..............	Nov. 15, 1882	♂ ad.	685	......	450	252	83	......
92759	1799	......do....................	Dec. 12, 1882.	♂ ad.	715	50	460	255	77	68
92758	1972	......do....................	Apr. 11, 1883.	♂ ad.	690	35	440	250	81	68
92760	1817	......do....................	Dec. 25, 1882.	♀ ad.	660	......	426	235	75	60

No. 92757.—Iris dark brown. Bill and feet black; toes below yellowish gray.

No. 92759.—Outstretched toes almost reach tip of wings. Caught in a trap set for foxes.

No. 92758.—Testes swollen. Weight 5 pounds.

No. 92760.—Weight, 4½ pounds.

The raven ("*vorón*" of the natives) is a resident on both islands, but is not numerous on either, although they are rather common near the killing-grounds of the seal-rookeries during and after the sealing season, but at that time all the ravens of the island are collected on these places. During the summer and autumn they feed almost exclusively upon the numberless carcasses of the slaughtered seals, fighting and quarreling at that time with the stone foxes and the glaucous-winged gulls. During the winter the supply of food is more scanty, and they are, during the hard season, restricted to what the ocean throws upon the beach, although of later years the introduction of *Arvicola rutila* has added a new and welcome dish to their bill of fare.

Early in the spring they commence building their nests in a hole, or a crack of some steep and inaccessible rock, the pairs being either single or in small colonies of three or four.

Being acquainted with Dybowski's statement respecting the crow-like voice of the Siberian raven, I paid special attention to the sounds uttered by our island form. I can most emphatically state that the latter has a voice which in no respect is like that of a crow (*Corvus cornix*), and the common notes "krôh" and "korr" are in fact almost identical with that of the Norwegian *C. corax*, while the bell-like, sonorous "klong, klong" is higher and a little less sounding. It has, however, another very peculiar note, which I have never heard before. It often happened on Copper Island that, when engaged in climbing high up on the steep mountain peaks, I was startled by a sonorous and distinctly articulated "haló, haló!" so like the voice of a human being that I repeatedly looked around to discover the supposed Aleut before raising my eyes to the skies, where the black scavenger amused himself by hallooing to a neighbor on the other side of the valley, who would then answer with a similar "haló!" It was only distinguishable from the human voice by its somewhat more metallic sound.

I need hardly add that the raven here, as in most places where he has been for some time in contact with man, is extremely shy and difficult to get at within shot range.

107. Corvus corone levaillantii (Less.).

1831.—*Corvus levaillantii* Less., Tr. d'Orn , p. 328.
1846.—*Corvus culminatus* Gray, Cat. Nep. Hodgs. (p. 102) (*nec* Sykes, 1831).
1858.—*Corvus corone* Kittl., Denkw., I, p. 313, and II, p. 412.—Swinh., Ibis, 1874, p. 159.—Blakist. & Pryer, Ibis, 1878, p. 232.—*Iid.*, Tr. As. Soc. Jap., VIII, 1880, p. 212.—*Iid.*, *ibid.*, X, 1882, p. 141.—Blakist., Amend. List B. Jap., p. 14 (1884).
1858.—*Corvus sinensis* Moore, Cat. B. Mus. E. Ind. Co., II, p. 556.—Swinh., Ibis, 1862, p. 260.—*Id.*, *ibid.*, 1863, pp. 95, 383.—*Id.*, *ibid.*, 1870, p. 348.—*Id.*, P. Z. S., 1863, p. 305.—*Id.*, *ibid.*, 1871, p. 383.
1861.—*Corvus japonicus* Swinh., Ibis, 1861, p. 337 (nec *japonensis* Bp.).
1862.—*Corvus japonensis* Swinh., Ibis, 1862, p. 260 (*nec* Bp.).
1864.—*Corvus colonorum* Swinh., Ibis, 1864, p. 427.—*Id.*, *ibid.*, 1866, pp. 296, 402.
1875.—*Corvus orientalis* Taczan., J. f. Orn., 1875, p. 251.—*Id.*, *ibid.*, 1876, p. 198 (*nec* Eversm.).—Dybow., Bull. Soc. Zool. France, 1883, p. 362.

The specimens of the Carrion Crow collected by me at Petropaulski agree in every respect with skins from Japan. The latter has been stated to be the same as the European *C. corone*, but a careful comparison has led me to a different conclusion. While agreeing with the European bird in size the color is quite different. In the true *corone* the gloss all over is most decidedly purplish, while in the Kamtschatkan and Japanese specimens before me the luster is equally decidedly greenish. In fact, the latter come, in this respect, nearer to the big.

billed *C. japonensis;* besides, the Eastern bird seems to have the first primary longer and the tail a trifle more rounded than true *C. corone.*

I have for comparison a skin from India, received from the Government Museum, Madras (U. S. Nat. Mus. No. 60495, ♂, May 8, 1867), which in every particular, in size as well as in color, matches my eastern specimens referred to above. It is marked *C. culminatus*, the identification being made at the Madras Museum, but that it is not the bird so named by Sykes is evident from the size alone, his *culminatus* being a considerably smaller bird. I feel, however, justified in referring this bird to *corone levaillantii* of Sharpe's Catalogue of B. Brit. Mus., III, p. 39,* a conclusion in which I feel the more confident as I perceive that the same excellent author has identified a pair from Ussuri in the British Museum (collected by Dr. Dybowski) as belonging to the species in question. It is therefore apparent that Taczanowski's *C. orientalis* of 1875 and 1876, as quoted above, belongs to the present form. Whether this name of his earlier publications relates to the same is not clear, as Sharpe has been unable to separate a specimen, which the British Museum received from Dr. Dybowski as *C. orientalis* (Balryna, E. Siberia, May 18, 1872) from the true *corone.* It thus appears as if Taczanowski has not distinguished the two forms.

The occurrence of *levaillantii* in Japan alongside the large-billed *C. japonensis* seems to indicate that they are not geographical races of the same species, but that they belong each to a different stock.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Culmen from frontal feathers.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
92765	2712	Petropaulski	Sept. 27, 1883	♂ ad.	500	55	335	200	54
92763	2729	......do	Oct. 1, 1883	♂ ad.	555	45	343	203	56
92764	2746	......do	Oct. 2, 1883	♂ ad.	520	52	330	203	56
92762	2602	......do	Sept. 20, 1883	♀	......	......	330	198	53
92761	2760	......do	Oct. 10, 1883	♀	......	......	324	195	59
92766	2713	......do	Sept. 27, 1883	♀ jun.	494	45	307	180	47

Iris dark brown. Bill and feet black.

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* By a typographical error the length of the tail of *levaillantii* is given as 9.5 inches, which is half an inch longer than the maximum length of the table of dimensions; the average length of the tail of the twenty-seven specimens is nearly 8.5 inches.

The Carrion Crow is as common in Petropaulski at the present day as it was formerly, according to the narratives of earlier travelers. They perform the same duties in Kamtschatka as do the vultures and turkey-buzzards, of more southern regions, and the more intelligent of the inhabitants, interested in the cleanliness of the town, object when anybody disturbs these public scavengers.

The Black Crow does not occur on the island, except as a rare straggler from the mainland. The cosak on Bering Island, Alexander Selivanoff, who, of course, was very familiar with these birds from his native place, Petropaulski, observed a single crow near the southern seal-rookery early in the spring of 1883.

108. Pica kamtschatica STEJNEGER.

1826.—*Corvus pica* PALL., Zoogr. Ross. Asiat., I, p. 389 (*part*).—KITTL., Denkw., II, p. 320 (1858).
1850.—*Pica caudata* BP., Consp. Av., I, p. 382 (*part*).
1858.—*Pica leuconotos* BREHM, J. f. Orn., 1858, p. 173 (*part*).
1876.—*Pica media* BLAKIST., Ibis, 1876, p. 333 (*nec* BLYTH).
1882.—*Pica leucoptera* STEJNEGER, Naturen, 1882, p. 182 (*nec* GOULD).—DYBOW., Bull. Zool. Soc. France, 1883, p. 362.
1884.—*Pica camtschatica* STEJNEGER, Pr. Biol. Soc. Washingt., II, p. 97.

The Kamtschatkan Magpie is the largest form with which I am acquainted, and exceeds in size even the Central Asiatic *P. leuconotos* BRM.* Unfortunately I have no Japanese specimens for comparison, but judging from Sharpe's table of dimensions, in his Cat. Birds Brit. Mus., III, p. 64, they do not seem to be larger than the average European bird, and Taczanowski (J. f. Orn. 1875, p. 251) informs us that the specimen from Ussuri (*op. cit.*, 1876, p. 198, identified as *P. japonica*) "is much smaller than Daurian and Baicalian Magpies (*P. leuconotos*)," and that "the wing and the tail are not so lustrous colored, being in that respect superseded even by the European Magpies." As the Kamtschatkan bird, besides its superior size, is one of the most brilliantly colored forms, it would seem improper to unite it with its southern neighbor.

A close comparison of adult specimens with South Chinese and Daurian specimens shows that *P. kamtschatica* differs from both *P. sericea* GOULD and *leuconotos* BRM. by having the feathers of the throat black to their very base, while the two latter forms have them distinctly white on their basal half. From the Chinese birds it is easily distinguished, (1) by having the primaries white to their very tips, while those in *P. sericea* have a rather broad, black edge; (2) by a larger and purer

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*Cab. Journ. f. Orn., 1858, p. 173, = *Pica leucoptera* GOULD, 1862.

white band on the rump; (3) by a more greenish gloss on the wings; (4) by much shorter tarsi, and, on the whole, much weaker and smaller feet; and (5) by the absence of white on the feathers of the throat.

It seems to me that the Chinese bird is a rather well defined form, the distinguishing marks of which are very well pointed out in Gould's original description, the greater extent of the blue gloss on the wing and the remarkable stoutness of the feet being especially characteristic features. It has, besides, a rather long bill. These characters hold good even in the young birds, which differ from the young *P. kamtschatica* in having the rump uniform black, while in the latter it has a broad whitish band.

From *leuconotos* our new bird differs in having a decidedly longer and stouter bill, the white on wing and rump still more developed, and the feathers on the throat entirely black. With the European form it agrees in having the throat-feathers entirely black,* but differs in the greater amount of white on wing and rump, the larger size, and the longer and stouter bill. In contradistinction to the young eastern bird, the young ones of the European form have the uropygium dark. In Northern and Eastern Europe (Northern Norway and Russia), there occurs a race which has more white on the primaries and on the rump than in the common central European bird, being otherwise undistinguishable. This race should stand as *Pica pica borealis*, while the Spanish race with black rump, which has already been described by Brehm from that country, is entitled to the name *Pica pica melanotos* (BRM., 1858).

Whether the different forms of Magpies mentioned intergrade, and to what degree, I am, at present, unprepared to state. It must not be forgotten, however, that if we accept the theory of hybridization as an explanation of the intergradation in similar cases, the same theory will be very applicable to the present group of birds. In fact, I see very little difference between the case of Magpies, and *e.g.*, that of the Grey Shrikes. In the mean time it does not seem proper to call the present bird *Pica pica camtschatica* until the intergradation is proved.

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* It is said that sometimes a European bird may be found having those feathers more or less white at the base. This would indicate that the common European form has sprung from an original stock having this feature. Such an individual, showing characters lost a long time ago by the species as a species, is liable to come up even among the best differentiated species, but, of course, they do not prove any intergradation with another allied form, which has still preserved the original feature.

Tables of dimensions.

A.—PICA KAMTSCHATICA.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Exposed culmen.	Tarsus.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89144*	1237	Petropaulski	June 29, 1882	♂ ad.	525	......	217	284	34	42
92695	2727	......do	Sept. 30, 1883	♂ ad.	525	185	218	274	35.5	45
92698	2596	......do	Sept. 18, 1883	♀ jun.	458	155	206	229	32.8	43.5
92697	2603	......do	Sept. 20, 1883	♂ juv.	......	......	214	253	36	44.5
92695	2755	......do	Oct. 8, 1883	♀ juv.	435	128	206	217	31.7	43

* Iris dark brown. Bill and feet black.

B.—PICA SERICEA.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Wing.	Tail-feathers.	Exposed culmen.	Tarsus.
						mm.	*mm.*	*mm.*	*mm.*
86103	Jouy & Dale	166	Hong-Kong	Oct. 10, 1881	♀ ad.	209	236	33	48
21102	Captain Rodgers	222	....do	Mar. —, 1855	....	199	231	33.3	46.7
85803	Jouy & Dale	43	Shanghai	Aug. 1, 1881	♀ juv.	201	212	35.6	46.5
85809	....do	44	....do	Aug. 1, 1881	....	198	206	33.8	49.8

C.—PICA PICA.

Number of specimens.	Wing.	Tail-feathers.	Exposed culmen.	Tarsus.
	mm.	*mm.*	*mm,*	*mm*
Average measurements of four male adults from Central Europe	186	226	29.3	42.7
Average measurements of four female adults from Central Europe	183	220	29.5	42.9

The Magpie is a common resident of Petropaulski.

On the 18th of May, 1883, I examined a nest built on the first branches of a *Salix*, about 9 feet above the ground, which under the tree was covered with 2 feet of snow. The structure which was not yet finished inside, consisted of dry sticks, forming a globular mass, the exterior diameter of which was about 30 inches. The nest, which was exactly like that of *P. pica*, contained no eggs at that time. The owners were shy, leaving the nest when I was still a great distance off.

They breed at least twice during the summer, and I suspect that the young (No. 92695), which I shot as late as the 8th of October, and which still was partly downy, belonged to a third brood.

No difference in the note from that of the European bird could be detected.

It is not known that the Magpie has ever been met with on the islands.

Family FRINGILLIDÆ.

109. Hypocentor aureolus (PALL.).

1773.—*Emberiza aureola* PALL., Reise Russ. Reichs., II, App. (p. 711).—*Id.*, Zoogr. Ross. Asiat., II, p. 52 (1826).—KITTL., Kupfert., p. 17, tf. 22, f. 1 (1833).—*Id.*, Denkwürd., II, p. 197 (1858).—MIDDEND., Sibir. Reise, II, 2 (p. 138) (1853).—SCHRENCK, Reise Amurl., I, p. 277 (1860).—RADDE. Reisen Süden Ost-Sibir. (p. 157 tb. iv, fig. a–h) (1863).—SWINH., Ibis, 1863, p. 378.—*Id.*, *ibid.*, 1870, p. 354.—PRZEW., Putesch. Ussur. (no. 41) (1870).—BLAK. & PRYER, Tr. As. Soc. Japan, VIII, 1880, p. 230.—*Id.*, *ibid.*, X, 1882, p. 170.—BLAKIST., Amend. List B. Jap., p. 17 (1884).—*Euspiza a.* SWINH., Ibis, 1860, p. 62.—*Id.*, *ibid.*, 1861, pp. 45, 334.—*Id.*, *ibid.*, 1875, p. 451.—*Id.*, P. Z. S., 1863, p. 354.—*Id.*, *ibid.*, 1871, p. 387.—DYBOW. & PARVEX, J. f. Orn., 1868, p. 335.—TACZAN., J. f. Orn., 1873, p. 90.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, Orn. Fauna Vost. Sibir., p. 38 (1877).—*Id.*, Bull. Soc. Zool. France, 1876, p. 178.—*Id.*, *ibid.*, 1882, p. 393.—BLAK. & PRYER, Ibis, 1878, p. 243.—BOLAU, J. f. Orn., 1880, p. 127.—*Id.*, *ibid.*, 1881, p. 59.—STEJNEGER, Naturen, 1882, p. 182.—*Id.*, Pr. U. S. Nat. Mus., 1883, p. 71.

This species is commonly given as *Euspiza aureola*, the name *Euspiza* being ascribed to Bonaparte with the date 1838. In his Comp. List, 1838, Bonaparte, however, created the genus name for *Emberiza americana* GM.; but having employed for this species the name *Spiza* as early as 1824 (Obs. Wils., No. 85, in Journ. Phil. Acad., IV, 1, August, 1824), the latter must stand, and *Euspiza* becomes only its synonym. The confusion arose from Bonaparte himself, who, in 1828 (Ann. New York Lyc.), used the name *Spiza* for a genus having *E. amœna* for type, this being renamed by Baird (B. N. A., p. 500), and called *Cyanospiza*, as the older appellation of Vieillot, *Passerina* was considered untenable because preoccupied by Linnæus in Botany. In his Consp. Av., I, p. 468, Bonaparte united *E. aureola* with *americana* in the same genus. A careful comparison of the two forms will convince one, however, of their generical distinctness. *Spiza americana* has a much stouter bill, the mandible especially being higher and more denuded at the base; the feet are much stouter and stronger, the tail proportionally shorter, less furcate, and with the single feathers remarkably pointed, a feature not at all indicated in *aureola*. Besides, only the second and third primaries are sinuated on the outer web, while in *Hypocentor* the fourth is also sinuated.

As *E. americana* is the type of *Euspiza*, the next name, *Hypocentor*, proposed by Professor Cabanis, must be adopted. The synonymy of this genus stands as follows:

Hypocentor CAB.

<1773.—*Emberiza* PALL., Reise Russ. Reichs., II (p. 711).
<1819.—*Passerina* VIEILL., Nouv. Dict. d'Hist. Nat., XXV, p. 1 (× *Passerina* DEGL. & GERBE, Orn. Eur., I, p. 300 (1867).
<1850.—*Euspiza* BONAP., Consp., I, p. 468 (nec 1838, quæ *Spiza*, BP., nec CAB., 1850, quæ *Granativora* BP.).
=1851.—*Hypocentor* CAB., Mus. Hein., I, p. 131.

The Gold-ammer, as this species might be termed, is only of occasional and rare occurrence on Bering Island during the migration seasons. Thus several specimens were shot during the spring of 1882. Remarkably enough, not a single one was seen during the same season of the following year, although 1883 brought such an abundance of rare stragglers.

Around Petropaulski it is one of the commonest summer birds, but seems to arrive rather late, as in 1883 it had not made its appearance on the 28th of May, and before the middle of September most of them had left their northern summer homes again. A single young bird was shot by me on the last day of the same month.*

It is especially frequent in the elder groves on the slopes behind the town, alongside with *Carpodacus* and *Calliope*, in comparison with which it is a poor songster, however, its melancholy tune strongly contrasting trasting with the merry concert of the others.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wings.	Tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*
88997	1175	Bering Island	June 9, 1882	♂ ad.	162	......	79	59
88996	1176	......do	June 9, 1882	♂ ad.	163	......	77	58
88995	1177	..... do	June 9, 1882	♂ ad.	155	......	79	62
88998	1199	......do	June 12, 1882	♂ ad.	149	......	77	57
92649	2299	Petropaulski	July —, 1883	ad.	......	......	79	60
92647	2726	...... do	Sept. 30, 1883	juv.	146	37	71	55

No. 88997.—Iris dark brown. Bill horny brown, lower mandible flesh colored. Feet pale brown.

No. 92647.—Iris dark brown. Bill dull flesh-colored, above brownish gray. Feet pale brownish gray.

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* I am indebted to Messrs. Sharpe and Blakiston for the identification of this specimen.

110. Hypocentor rusticus (Pall.).

1776.—*Emberiza rustica* Pall., Reise Russ. Reichs. (III, App., p. 698).—*Id.*, Zoogr. Ross. Asiat., II, p. 43 (1826).—Kittl., Kupfert., p. 17, tf. 22, fig. 2 (1833).—*Id.*, Denkwürd., I, pp. 314, 330, II, p. 200 (1858).—Midd., Sibir. Reise, II, 2 (p. 139) (1853).—Schrenck, Reise Amurl., I, p. 278 (1860).—Blakist., Ibis, 1862, p. 328.—Radde, Reisen Süden Ost-Sibir., II, (p. 173) (1863).—Swinh., P. Z. S., 1863, p. 301.—*Id.*, *ibid.*, 1871, p. 388.—*Id.*, Ibis, 1874, p. 161.—*Id.*, *ibid.*, 1876, p. 333.—Whitely, Ibis, 1867, p. 202.—Dybow. & Parvex, J. f. Orn., 1868, p. 335.—Przew., Putesch. Ussnr. (n. 46) (1870).—Taczan., J. f. Orn., 1873, p. 89.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, Orn. Fauna Vost. Sibir., p. 36 (1877).—*Id.*, Bull. Soc. Zool. France, 1876, p. 175.—*Id.*, *ibid.*, 1882, p. 393.—Blakist. & Pryer, Ibis, 1878, p. 243.—*Iid.*, Trans. As. Soc. Japan, VIII, 1880, p. 229.—*Iid.*, *ibid.*, X, 1882, p. 169.—Bolau, J. f. Orn., 1880, p. 128.—*Id.*, *ibid.*, 1881, p. 59.—Blakist., Amend. List B. Jap., p. 17 (1884).

A male in fine spring plumage was shot on Bering Island during my absence in Petropaulski, May 21, 1883, and was prepared by my native assistant, who also measured the total length and examined the sex. Two weeks later I shot another specimen on the large tundra behind the village of Bering Island, this one being a female.

This beautiful species is only a rare straggler on the island, and its appearance in the spring of 1883 was due to the same meteorological circumstances which at that time brought so many rare birds over to the treeless island from the dense woods of Kamtschatka.

On the peninsula I met it in the fall of the same year. Single individuals were observed in the dense elder and birch thickets round Petropaulski. The birds were then silent and very shy, and kept themselves very quiet near the ground on the lowest branches. None were seen after the 5th of October, when the last one was shot.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*
92644	2071	Bering Island	May 21, 1883	(♂) ad.	(150)	......	78	61
92645	2128	......do	June 6, 1883	♀ ad.	148	31	74	58
92648	2640	Petropaulski	Sept. 25, 1883	......	152	31	74	60
92646	2747	......do	Oct. 5, 1883	♂	157	41	75	61

No. 92645.—Iris dark brown. Upper mandible horny blackish brown, except tomia, which, like the lower mandible, are brownish flesh-colored. Feet light and clear grayish brown. Exceedingly fat.

No. 92646.—Bill horny blackish brown at base, and most of lower mandible rose flesh-color. Legs light grayish flesh-color, joints darker.

111. Hypocentor variabilis (TEMM.).

1835.—*Emberiza variabilis* TEMM., Pl. Color, III, livr. 98, pl. 583, fig. 2.—TEMM. & SCHLEG., Fauna Japon. Aves (pl. 56) (1847).—BLAKIST. & PRYER, Trans. As. Soc., VIII, 1880, p. 230.—*Iid. ibid.*, X, 1882, p. 171.—BLAKIST., Amend. List B. Jap., p. 13 (1884).—*Euspiza v.* SWINH., Ibis, 1875, p. 450.—BLAKIST. & PRYER, Ibis, 1878, p. 243.—TACZAN., Bull. Soc. Zool. France, 1879, p. 137.—*Id., ibid.*, 1882, p. 393.—*Id.*, J. f. Orn., 1881, p. 184.

1858.—*Zonotrichia musica* KITTL., Denkw., II, p. 201.—HARTL., J. f. Orn., 1859, p. 50.

I refer this species with much doubt to *Hypocentor*, and should, in fact, prefer to see it made the type of a distinct genus. It has a large bill with a remarkably long gonys; the tomia of the upper mandible are very little inflected, the nasal grooves are nearly filled with hairy feathers, and at the base are several rather strong bristles. The wing is rather short and much more rounded, the first primary being intermediate between fourth and fifth. The hind claw is very small.

There can, in my opinion, be no doubt that this is the *Zonotrichia musica* of v. Kittlitz, described by him from Kamtschatka, as he (*l. c.*) gives a very recognizable description of the old male: "It was light bluish-ash colored, only on the lower surface gradually becoming whitish; back and wing feathers black with broad edges of the same beautiful ash color as the rest of the plumage; bill and feet yellowish flesh-colored, the former grayish above; iris dark brown."

The only bird of this species which came within my observation was an adult male, an accidental straggler from Kamtschatka, shot by me in a small ravine close by the village of Bering Island on the 11th of June, 1883.

Although terribly damaged by the shot, and thus making a very poor specimen for the collection, it suffices for the following measurements and remarks:

U. S. Nat. Mus. No. 92643, *L. Stejneger No.* 2158.

♂ ad. Testes very large, swollen. Total length, 168^{mm}; tail beyond wings, 38^{mm}; wing, 86^{mm}; tail-feathers, 74^{mm}.

Bill blackish brown, tomia and lower mandible flesh-colored. Feet light brownish flesh-colored; claws pale.

The plumage is similarly colored to that described by v. Kittlitz above, but the black markings on the interscapular region are rather small and nearly obsolete.

This peculiar plumage, so unlike the general style of Old World *Emberizinæ*, reminds one strongly of some of the forms inhabiting the western shores of South America.* In fact, this bird seems really to be not so very distantly related to those groups of the same family which have been considered peculiar to the New World, and v. Kittlitz was not so very far out of the way in his generic determination as he perhaps might seem to be.

112. **Plectrophenax nivalis** (LINN.).

1758.—*Emberiza nivalis* LIN., Syst. Nat., 10 ed., I, p. 176.—PALL., Zoogr. Ross. Asiat., II, p. 32 (1846).—*Plectrophanes n.* MIDD., Sibir. Reise, (II, 2, p. 136) (1853).—SCHRENCK, Reise Amurl., I, p. 275 (1860).—RADDE, Reisen Süden Ost-Sibir. (p. 156) (1863).—SWINH., P. Z. S., 1863, p. 301.—*Id.*, *ibid.*, 1871, p. 389.—*Id.*, Ibis, 1875, p. 451.—DYBOW. & PARVEX, J. f. Orn., 1868, p. 335.—FINSCH, Abh. Nat. Ver. Bremen, III, 1872, p. 54.—TACZAN., J. f. Orn., 1873, p. 86.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, Orn. Fauna Vost. Sibir., p. 35 (1877).—*Id.*, Bull. Soc. Zool. France, 1876, p. 174.—*Id.*, *ibid.*, 1882, p. 393.—COUES in Elliot, Aff. Alaska, p. 176 (1875).—HARTING, Fauna Prybilov, p. 17 (1875).—BLAKIST. & PRYER, Ibis, 1878, p. 244.—*Iid.*, Trans. As. Soc. Japan, VIII, 1880, p. 231.—*Iid.*, *ibid.*, X, 1882, p. 172.—ADAMS, Ibis, 1878, p. 426.—BOLAU, J. f. Orn., 1881, p. 60.—*Id.*, *ibid.*, 1882, p. 336.—ELLIOTT, Monogr. Seal-Isl, p. 128 (1882).—BEAN, Pr. U. S. Nat. Mus., 1882, p. 149.—NELSON, Cruise Corwin, p. 68 (1883).—BLAKIST., Amend. List B. Jap., p. 62 (1884).—*Plectrophenax n.* TURNER, Auk, 1885, p. 157.

The snow-bunting is the "*sniegirok*" (plur. *sniegirki*) of the natives, and is one of the few passerine birds which are resident on the islands during the whole year. It must at once be remarked, however, that only a few remain during the winter, feeding upon what the beach may offer, contenting themselves for the greater part with *Gammaridæ* and other small crustaceans, while the bulk emigrates at the beginning of the cold season. During the whole winter single individuals, or two together, but never even small flocks, were seen at low tide on the sandy beaches close to the water's edge, being at that time just as much a "limicoline" bird as *Actodromas couesi*, both in respect to food and the locality. During this season they were silent, and even more shy, perhaps, than usual, but from the beginning of March the males would commence practicing to find out if they had forgotten the song of the foregoing year. The snow-bunting has a pretty voice, and when I again heard its sweet cadences after the long winter on the storm-beaten island I fancied it the loveliest of the songsters, carrying my dreams far away to sunnier regions by his soft and unpretentious melody. At this time he only sings when sitting on the ground, preferring some projecting rock or stone, but later, during the breeding season, he will sing when rising into the air on quivering wings like a lark; but how Boie could compare his modest and gentle warbling with the vigorous and intricate trill of the skylark is rather incomprehensible to me.

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* I refer here especially to *Phrygilus unicolor* (D'ORBIGN.), the male of which, in general coloration and size, is an almost perfect counterpart of my specimen. In fact, the likeness is so great that a superficial observer might take them for the same or very nearly related species, and any one adopting color as the leading characteristic of the genera would be forced to put *E. variabilis* from Japan into the South American genus *Phrygilus*.

On the 28th day of March, 1883, a small troop of new arrivals were observed on Bering Island, but they did not become abundant until three weeks later. They never came in large flocks, and soon disbanded. The single pairs then disperse over the island, settling wherever there are steep cliff-walls or rugged bluffs in the interior, or along the coast, far up on the mountains and down below at the beach, but always avoiding the wet tundra or the flat, dreary, mountain plateaus of the northern part. If the season is open and otherwise favorable, the first eggs will be laid shortly after the middle of May; the young will be out in the beginning of June, and in July I have found the fresh eggs of a second brood.

The measurements of the eggs taken are as follows:

U. S. Nat. Mus. No.	Stejneger No.	Diameters.	Date.	Locality.	Remarks.
		Millimeters.			
21812	1230	24 by 17.5	June 15, 1882	Copper Island	Nest contained five eggs.*
		24.5 by 17			
21812 bis	2518	23.5 by 18.5	July 3, 1883	Bering Island..............	....
21813	1227	24 by 18	June 4, 1882	Copper Island	Full clutch.
		24.5 by 18			
		24.25 by 18			
		24.75 by 18			
21814	1229	26 by 17.75	June 11, 1882	......do......	Do.
		26 by 17.25			
		27 by 17.5			

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* Dimensions of nest: External diameter, 110^{mm}; internal diameter, 70^{mm}.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*
88999	1033	Bering Island	May 10, 1882	♂ ad.	176	110	66
89001	1060	......do	May 19, 1882	♂ ad.	190	120	78
89000	1086	..... do	May 24, 1882	♂ ad.	185	113	72
92650	1693	......do	Oct. 23, 1882	♂	198	113	78
92651	1778	..... do	Dec. 13, 1882	....	187	112	72
92652	2220	Copper Island	July 2, 1883	juv.	......	98	63
92653	2217	......do	July 1, 1883	juv.	144	83	40

No. 89001.—Iris dark brown. Bill black, corner of mouth yellow. Feet brownish black.

No. 92650.—Bill yellow, tip and culmen blackish. Feet brownish black.

No. 92653.—Iris dark brown. Bill light brownish yellow, dusky on culmen, and with a greenish tinge in front of nostrils; angle of mouth pale yellow. Feet gray, with a purplish tinge above and yellowish below.

No. 92652.—Differed from the foregoing only in having the more dusky on the upper mandible.

113. Calcarius lapponicus (Lin.).

1758.—*Fringilla lapponica* Lin., Syst. Nat., 10 ed., I, p. 180.—*Plectrophanes l.* Swains. & Rich., Faun. Bor. Am., II, p. 245, pl. xlviii (1831).—Midd., Sibir. Reise, II, 2, (p. 136) (1853).—Schrenck, Reise Amurl., I, p. 276 (1860).—Swinh., Ibis, 1861, p. 334.—*Id.*, P. Z. S., 1871, p. 389.—Radde, Reisen Süden Ost-Sibir. (p. 156) (1863).—Przew., Putesch. Ussur. (n. 40) (1870).—Finsch, Abh. Nat. Ver. Bremen, III, 1872, p. 54.—Taczan., J. f. Orn., 1873, p. 86.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, Ornith. Fauna Vost. Sibir., p. 35 (1877).—*Id.*, Bull. Soc. Zool. France, 1882, p. 393.—Coues in Elliott's Aff. Alaska, p. 177 (1875).—Harting, Fauna Prybil., p. 17 (1875).—Adams, Ibis, 1878, p. 425.—H. W. Elliott, Monogr. Seal Isl., p. 128 (1882).—*Centrophanes l.* Swinh., P. Z. S., 1863, p. 301.—Bean, Pr. U. S. Nat. Mus., 1882, p. 150.—Nelson, Cruise Corwin, p. 69 (1883.)—*Calcarius l.* Turner, Auk, 1885, p. 157.

1773.—*Fringilla calcarata* Pall., Reise Russ. Reichs., II, App., p. 710.—*Passer calcaratus Id.*, Zoogr. Ross. Asiat., II, p. 18, (1826.)—*Plectrophanes calcaratus* Kittl., Denkw., I, p. 337.

The "*Tschelutschjék*," as this bird is called by the natives, is one of the commonest of the land birds on the Commander Islands, and certainly the commonest on Bering Island, being pretty evenly distributed over all the lower parts of the country. Its monotonous and melancholy chirp is in many places the only sound heard besides the howling of the wind and the murmur of the distant breakers, making the fog-clad tundras still more desolate and gloomy. But the Longspur is also found among the earth-huts and the houses of the village, where he represents the house sparrow, and I have seen him on the snow-fields as well as on the outmost stones of the surf-washed reef, and found their snug nests both in the dampest place of the large swamp and on the dry, sunny bluffs of the sand-hills or on the lichen-covered slopes of the mountains. In the interior, and higher up in the mountains, the Snow-ammer takes his place, however.

About its occurrence in Kamtschatka I can only say that I met a single, exceedingly shy individual at the graveyard of Petropaulski during the first half of October.

They had already commenced their breeding business when I arrived at the islands, in May, 1882, and it was, in fact, the first bird of my collection. When the autumn storms commenced, the families gathered together in small flocks and left our inhospitable islands for milder regions, and in the latter part of October only some few solitary birds were seen, but these also soon disappeared. Not a single one remained on its native island during the winter, and not before the 21st of April did we hear the well-known chirping of the few first arrivals. It was not until after the lapse of several days that the bulk of them landed, and the flocks very soon dissolved into pairs eager to begin the old story of love and parental happiness and sorrows. There were enough of enemies bringing on the latter, among them the collector of the National Museum. The eggs taken measure as follows:

U. S. Nat. Mus. No.	Stejneger No.	Diameters.	Date.	Locality.	Remarks.
		Millimeters.			
21776	1197	22.5 by 17	June 11, 1882	Bering Island..............	Full clutch.
		23 by 16.25			
		22 by 17			
21775	1183	23 by 15	June 9, 1882	......do	Do.
		22.5 by 16			
		22 by 15.5			
21774	1160	22 by 16	June 6, 1882	......do	Nest contained two eggs.
21817	2197	....	June 6, 1883	......do	Clutch of four eggs.
		20.5 by 15.25			
		21 by 15			
		20 by 15			
21815	2111	22 by 17	May 23, 1883	......do	Full clutch.
		21.75 by 16.25			
		21.75 by 17			
21816	2112	22 by 15.5	May 30, 1883	......do	Do.
		23 by 15			
		23 by 15.5			

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*
89167	1002	Copper Island	May 6, 1882	♂ ad.	174	98	64
89168	1003	......do	May 6, 1882	♂ ad.	170	99	68
89169	1004	......do	May 6, 1882	♂ ad.	167	97	67
89005	1013	Bering Island	May 9, 1882	♂ ad.	165	95	66
89004	1018	......do	May 9, 1882	♂ ad.	156	97	66
89002	1011	......do	May 9, 1882	♀ ad.	162	90	60
89003	1019	......do	May 9, 1882	♀ ad.	159	94	62
89131	1216	Copper Island	June 21, 1882	♀ ad.	155	90	61
92655	1704	Bering Island	Oct. 31, 1882	♂ ad.	172	96	65
92654	1687	......do	Oct. 16, 1882	♂ jun.	161	90	65
92656	1699	......do	Oct. 26, 1882	♀ jun.	162	86	62
89015	1262	......do	July 15, 1882	♂ juv.	157	87	58
89016	1264	......do	July 18, 1882	♂ juv.	108	57	20

No. 89004.—Iris dark brown. Feet brownish black.

No. 89131.—Bill brownish yellow with blackish tip. Feet dark brown.

No. 92654.—Iris dark hazel. Bill reddish gray, black at tip of upper mandible. Feet dark brownish gray.

No. 92656.—Bill light brownish gray, tip blackish. Feet blackish brown.

No. 89015.—Iris dark brown. Bill brownish gray with a yellow spot along the middle of upper tomium. Feet reddish pearl gray.

No. 89016.—Bill dark gray, tomium of upper mandible, angle of mouth, and tip of mandibles whitish. Feet brownish flesh-color, tarsus behind and toes below yellowish.

The specimens from the Commander Islands are very bright-colored, the chestnut, black, and white being of greater purity than is perhaps usual. This is, however, the only difference which can be detected in a large series, and individuals just as bright are not unfrequent from other localities.

114. Acanthis* linaria (Lin.).

1758.—*Fringilla linaria* Lin., Syst. Nat., 10 ed., I, p. 182.—Kittl., Denkw., I, p. 321 (1858).—*Passer l.* Pall., Zoogr. Ross. As., II, p. 25 (1826).—*Ægiothus l.* Swinh., P. Z. L., 1863, p. 299.—*Acanthis l.* Dybow. & Parvex, J. f. Orn., 1868, p. 335.—Taczan., J. f. Orn., 1873, p. 92.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, *Ibid.*, 1876, p. 200.—*Id.*, Bull. Soc. Zool. France, 1876, p. 180.—*Id.*, *Ibid.*, 1882, p. 394.—*Id.*, Orn. Fauna Vost. Sibir., p. 39 (1877).—Dybowski, Bull. Soc. Zool. France, 1883, p. 365.—*Ægiothus l.* Blakist. & Pryer, Ibis, 1878, p. 245.—Bolau, J. f. Orn., 1880, p. 127.—*Id.*, *ibid.*, 1882, p. 335.—Bean, Pr. U. S. Nat. Mus., 1882, p. 149.—Nelson, Cruise Corwin, p. 68 (1883).—Ridgw., Pr. U. S. Nat. Mus., 1883, p. 371.

1880.—*Linota rufescens* (?) Blakist. & Pryer, Trans. As. Soc. Japan, VIII, 1880, p. 233 (*nec* Vieill.).—*Id.*, *ibid.*, X, 1882, p. 174.

1883.—*Acanthis innominatus* Dybowski, Bull. Soc. Zool. France, 1883, p. 366.

This form seems to be the common breeding bird on the mainland of Kamtschatka, where I got a very young specimen near Petropaulski on the 4th of July, 1882.

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* About the generic term see "Notes on the genus Acanthis," in "The Auk," 1884, p. 145.

I do not think that it breeds on the islands, however, as it was not met with from the end of May until the beginning of November. Between the 21st and the 28th of May, 1882, I met a few small troops, consisting of three to five individuals, but their behavior convinced me that they were not thinking of breeding; they were probably on their way westward. During the winter, from November till March, this race was the most common of the three forms occurring on the island, although never met with in flocks of more than six individuals. They were always moving rapidly and distinguished themselves by a remarkable shyness.

Having discussed the affinities of the birds in question further on under the heading of *A. exilipes*, as also in a previous paper (Auk, 1884, p. 148), I content myself here by only giving some comparative measurements of birds from different parts of the circumpolar realm. Among these are several specimens marked *L. ordinaria*, *parvirostris*, or *betularum* in Sundevall's own handwriting. It will be seen that only such specimens have been selected for measurement, the locality, date, and sex of which were stated by the collector. Five specimens collected by myself, the sex of which I was unable to determine, are kept separate in the list of specimens collected. It is too often the fault of authors pretending to give the results of "careful comparisons" that they mix birds of different sex and age, and from different seasons, together, without stating the known particulars pertaining to every single specimen, thus depriving the public of the means by which an intelligent judgment respecting the value of the conclusion arrived at, can be formed.

List of specimens collected (sex determined).

a.—SUMMER SPECIMENS.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Bill from nostrils.	Wing.	Tail-feathers.	Furcation of tail.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
89006	1065	Bering Island	May 21, 1882	♂ ad.	126	7.5	73	59	11
89012	1111	......do	May 28, 1882	♂	127	7	72	......	......
		Average		....	126.5	7.2	72.5	......	......
89013	1066	Bering Island	May 21, 1882	♀	122	8	70	55	9
89010	1067	......do	May 21, 1882	♀	124	7	75	58	10
89011	1082	......do	May 25, 1882	♀	122	7	70	55	11
89014	1112	......do	May 28, 1882	♀	......	7	68	55	......
		Average		....	122.7	7.2	70.7	55.7	10

List of specimens collected—Continued.

b.—WINTER SPECIMENS.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Bill from nostrils.	Wing.	Tail-feathers.	Furcation of tail.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
92594	1793	Bering Island	Dec. 13, 1882	♂ ad.	133	7	75	58	11
92604	1859	......do	Jan. 8, 1883	♂ ad.	128	7	75	61	10
92589*	1941	......do	Mar. 7, 1883	♂ ad.	122	7.5	70	54	10
92602	1960	......do	Mar. 22, 1883	♂ ad.	131	7.5	73	58	10
92610	1861	......do	Jan. 8, 1883	♂	......	7	73	56	11
92618	1912	......do	Feb. 21, 1883	♂	133	7	74	61	13
92615	1913	......do	Feb. 21, 1883	♂	132	7.5	74	61	11
92623	1951	......do	Mar. 12, 1883	♂	129	8	71	54	9
		Average	......	......	130	7.5	73	58	11
92595	1714	Bering Island	Nov. 8, 1882	♀	130	7.5	71	57	11
92587	1787	......do	Dec: 10, 1882	♀	120	7.5	71	55	11
92588	1788	......do	Dec. 10, 1882	♀	120	7	71	56	13
92586	1789	......do	Dec. 10, 1882	♀	125	7	70	56	9
92605	1786	......do	Dec. 10, 1882	♀	126	7	71	55	9
92607	1796	......do	Dec. 13, 1882	♀	132	7	72	58	11
92616	1860	......do	Jan. 8, 1883	♀	126	6.5	70	55	10
92590	1898	......do	Feb. 5, 1883	♀	128	8	71	55	8
92612	1918	......do	Feb. 24, 1883	♀	126	7	69	55	......
92608	1937	......do	Mar. 4, 1883	♀	126	7	71	55	10
92611	1936	......do	Mar. 4, 1883	♀	128	7.5	74	58	9
92593	1956	......do	Mar. 18, 1883	♀	128	7	72	57	......
92591	1957	......do	Mar. 21, 1883	♀	122	7	70	53	9
		Average	......	......	125.9	7.2	71	55.8	10

*Hybrid (?).

List of specimens collected (sex undetermined).

89009	1091	Bering Island	May 25, 1882	......	125	7	70	57	9
92598	1713	......do	Nov. 8, 1882	......	128	7.5	71	54	10
92585	1729	......do	Nov. 13, 1882	......	123	7	70	56	12
92613	1785	......do	Dec. 10, 1882	......	127	7.5	71	56	10
92606	1844	......do	Jan. 2, 1883	......	129	8	73	58	......
89161	1246	Petropaulski	July 4, 1882	juv.	129	6	67	55	......

Tables of dimensions.

1.—PALÆARCTIC SPECIMENS (*BETULARUM*).

A.—WINTER SPECIMENS.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Bill from nostrils.	Wing.	Tail-feathers.	Furcation of tail.
						mm.	*mm.*	*mm.*	*mm.*
52436	Sundevall...	11	Stockholm..............	Mar. 22, 1864	♂ ad.	7	75	57	9
52437	....do	10	......do................	Jan. 22, 1859	♂	8	74	57	12
34135	....do	9	......do..................	Oct. —, 1853	♂	8	73	57	11
			Average............	....	....	7.7	74	57	10.7
34139	....do	2	......do..................	Dec. —, 1841	♀	7	69	57	12
34142	....do	7	......do..................	Mar. 24, 1863	♀	7.5	73	56	8
			Average	....	....	7.2	71	56.5	10

B.—SUMMER SPECIMEN.

34138	Sundevall...	......	Sweden, 62° latitude......	June 3, 1857	♂ ad.	7.5	75	55	10

2.—NEARCTIC SPECIMENS.

A.—WINTER SPECIMENS.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Bill from nostrils.	Wing.	Tail-feathers.	Furcation of tail.
						mm.	*mm.*	*mm.*	*mm.*
39364	B. R. Ross ...	823	Fort Simpson..................	Apr. 26, 1860	♂ ad.	7.5	77	59	10
60970	Schmidt	1129	Green River, Wyo	Oct. 10, 1870	♂ ad.	...	72	55	11
83404	Merrill	430	Fort Shaw	Jan. 3, 1880	♂ ad.	7.5	75	59	9
86903	Rosevelt.....	441	Garrison, N. Y	Jan. 16, 1875	♂ ad.	8	74	58	9
88050	Shufeldt	287	Fort Laramie, Wyo	Nov. 6, 1878	♂ ad.	8	75	59	9
			Average	....	......	7.8	74.8	58	9.6
73303	Turner	1490	Fort Yukon, Alaska	Apr. 15, 1877	♀ ad.	7.5	68	56	11
68645	Bean	......	Fort Runyon, Va............	Feb. 19, 1875	♀ ad.	8	74	60	.....
83397	Boardman	......	New Brunswick	Jan. —, 1879	♀ ad.	8	76	62	12
88399	Nelson.......	1036	Rhode Island	Mar. —, 1875	♀ ad.	7	68	58	12
			Average	....	......	7.6	71.5	59	11.7

2.—NEARCTIC SPECIMENS—Continued.

B.—SUMMER SPECIMENS (*fuscescens* COUES).

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Bill from nostrils.	Wing.	Tail-feathers.	Furcation of tail.
						mm	*mm.*	*mm.*	*mm.*
18002*	Coues....	......	Groswater Bay, Labrador	July 23, 1860	♂ ad.	7.5	73	58	10
18098*	....do..........	......	......do........................	July 24, 1860	♂ ad.	7.5	72	56	9
18100	....do..........	1454	......do........................	July 17, 1860	♂ ad.	7	72	55	9
51914	McFarlane ...	3479	Rendezvous Lake, Arct. Am..	June —, 1865	♂ ad.	7.5	73	......	.....
58428	Bischoff	......	Fort Kenay, Alaska	May 28. 1869	♂ ad.	7.5	70	56	9
73304	Turner	1615	Fort Yukon, Alaska	May 3, 1877	♂ ad.	8	73	57	8
86526	McKay	4	Nushagak, Alaska	June 21, 1881	♂ ad.	7.5	70	55	10
			Average	....	......	7.5	71.9	56.3	9.2
	Kennicott	685	Fort Resolution, Arct. Am....	June 13 ——	♀ ad.	7.5	69	53	8
18097†	Coues	......	Groswater Bay, Labrador.	July 17, 1860	♀ ad.	6	67	54	10
27446	Lockhart	195	Fort Yukon, Alaska	June 30 ——	♀ ad.	7.5	70	58	8
43318	McFarlane ...	1600	Fort Anderson, Arct. Am.....	June 8, 1864	♀ ad.	7.5	69	55	10
81367	Bean..........	3339	Chugachik Bay, Alaska.	July 1, 1880	♀ ad.	7	71	58	11
			Average	....	......	7.1	69.2	55.6	9.4

* Type! † Bill very worn.

115. Acanthis linaria holboellii (BREHM).

1826.—*Passer linaria* PALL., Zoogr. Ross. As., II, p. 25 (*part*).

1831.—*Linaria holboellii* BREHM, Handb. Vög. Deutschl., p. 280.—*Acanthis h.* TACZAN., J. f. Orn., 1874, p. 324.—*Id.*, Bull. Soc. Zool. France, 1876, p. 180.—*Id.*, Orn. Faun. Vost. Sibir., p. 40 (1877).—DYBOW., Bull. Soc. Zool. France, 1883, p. 365.

1883.—*Acanthis intermedius* DYBOWSKI, Bull. Soc. Zool. France, 1883, p. 365.

The long and slender-billed Red Poll is a resident of Bering Island, and is probably the only form which remains there during the summer. It may be, however, that it leaves the island late in winter, as I did not get a single specimen between the 2d of January and the middle of April, although every Red Poll which came within shot range was brought down for identification.

A careful comparison with American specimens (cf. my memoir in The Auk, 1884, p. 148) and with typical specimens of Sundevall's *magnirostris* shows no tangible difference. They are rather typical both in size and color, and represent the distinctive characters from the *linaria vera* pretty well.

Below I give, besides a list of the specimens obtained by me and their dimensions, a table of measurements taken from Scandinavian specimens, three of which are marked "*magnirostris*" in Sundevall's own handwriting.

List of specimens obtained.

A.—SUMMER SPECIMENS.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wing.	Bill from nostrils.	Wing.	Tail-feathers.	Furcation of tail.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
89008	1090	Bering Island	May 28, 1882	♂	134	......	9	70	55	11
92609	2168	do	June 13, 1883	♂	137	25	9	75	58	12
89007	1076	do	May 23, 1882	♀	136	......	9	72	61	14

B.—WINTER SPECIMENS.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wing.	Bill from nostrils.	Wing.	Tail-feathers.	Furcation of tail.
92592	1701	Bering Island	Oct. 27, 1882	♂ ad.	139	......	9	74	57	10
92597	1702	do	Oct. 28, 1882	♂ ad.	135	......	8.5	75	60	10
92596	1728	do	Nov. 13, 1882	♂ ad.	132	......	8.5	75	58	11
92600	1794	do	Dec. 13, 1882	♂ ad.	136	......	9	78	60	11
92599	1845	do	Jan. 2, 1865	♂	133	......	9	76	60	12
92601	1846	do	Jan. 2, 1883	♂	132	......	8	76	50	12
92603	1792	do	Dec. 13, 1882	♂ ad.	137	......	9	74	58	11
92625	1777	do	Dec. 4, 1882	♀	133	......	9	73	57	11

No. 92609.—Iris dark brown. Bill horny brownish black; tomia and base of lower mandible below yellowish gray; angle of mouth yellow. Feet blackish brown.

No. 92592.—Bill orange yellow; culmen and anterior half of gonys horny brown.

Table of dimensions of Scandinavian specimens.

A.—WINTER SPECIMENS.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Bill from nostrils.	Wing.	Tail-feathers.	Furcation of tail.
						mm.	*mm.*	*mm.*	*mm.*
34141	Sundevall	11	Stockholm	Mar. 20, 1863	♂ ad.	9	77	58	8
34133	do	7	do	Oct. 30, 1853	♀	9	71	56	12
34134	do	8	do	Oct. 14, 1855	♀	9	72	57	11

B.—SUMMER SPECIMENS.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Bill from nostrils.	Wing.	Tail-feathers.	Furcation of tail.
	Stejneger	116	Western Norway	July 30, 1873	♂ ad.	8	75	55	7
	do	171	do	July 21, 1875	♂ ad.	8	75	56	10

116. Acanthis hornemannii exilipes (Coues).

1860.—*Fringilla* (*Acanthis*) *linaria* var. *canescens* Schrenck, Reise Amurl., I, p. 296.

1861.—*Cannabina canescens* Swinh., Ibis, 1861, p. 335 (*nec* Gould).—*Ægiothus c. Id.*, P. Z. S., 1863, p. 299.—*Acanthis c.* Dybow. & Parvex, J. f. Orn., 1868, p. 335.—Taczan., J. f. Orn., 1873, p. 92.—*Id.*, *ibid.*, 1874, p. 336—*Id.*, Bull. Soc. Zool. France, 1876, p. 180.—*Id.*, Orn. Fauna Vost. Sibir., p. 40 (1877).—Dybowski, Bull. Soc. Zool. France, 1883, p. 366.

1861.—*Ægiothus exilipes* Coues, Pr. Phil. Acad., 1861 (p. 385).

1872.—*Ægiothus linaria* var. *exilipes* Coues, Key, p. 131 (1872).

1874.—*Ægiothus canescens exilipes* Ridgw., Ann. Lyc. Nat. Hist. New York, X, 1874, p. 372.—Bean, Pr. U. S. Nat. Mus., 1882, p. 149.—Nelson, Cruise Corwin, p. 67 (1883).

1871.—*Ægiothus borealis* Swinh., P. Z. S., 1871, p. 386 (*nec* Vieill.).—*Id.*, Ibis, 1874, p. 160.

1880.—*Linota linaria* Blakist. & Pryer, Trans. As. Soc., VIII, 1880, p. 233.—*Id.*, *ibid.*, X, 1882, p. 174.

The smaller white-rumped Red Poll is only a winter visitor to Bering Island from more northern regions. They were found in very limited numbers from November to March, flitting hastily from one dry stem of *Archangelica*, on the seeds of which they mostly feed, to another.

Though connected with the large Greenland form *hornemanii* Holb. (*canescens* auct. *nec* Gould), which it very closely resembles in coloration by intermediate forms, it is sufficiently distinct to be designated by a separate name. *A. hornemanii* proper is restricted as a breeding bird to Greenland, from whence it in winter visits the most northern parts of Eastern America. It is by far a larger bird, as the following comparison shows: The wings of the five males from Bering Island average (cfr. the table below) 72$^{\mathrm{mm}}$, the tails 57.6$^{\mathrm{mm}}$, and the bills 6.4$^{\mathrm{mm}}$, while the average dimensions of six males in winter plumage of the Greenland form, give 85.3 (average of 86, 86, 82, 86, 87, 85) $^{\mathrm{mm}}$ for the wing, 66.3 (66, 64, 66, 69, 67, and 66) $^{\mathrm{mm}}$ for the tail, and 8$^{\mathrm{mm}}$ (the bills in all six being equal) for the bill. This gives a difference of 13.3$^{\mathrm{mm}}$ in the wing, 8.7$^{\mathrm{mm}}$ in the tail and 1.6$^{\mathrm{mm}}$ in the bill, differences which are quite considerable in so small birds. It will be observed, however, from the tables given below, that the American specimens of *exilipes* are a trifle larger, and even some larger examples from Eastern America might have been added to the list had it not been that I restricted the table to specimens, the locality, date, and sex of which was marked down on the label by the collector. Nevertheless, the difference between the two forms is so great that I have been somewhat doubtful whether they might not be regarded as fairly established species.

The present form occurs in the eastern part of Asia, having been found in winter as far south as North China and Japan, and is usually quoted by authors treating of the birds of these regions as *A. canescens*.

Its chief habitat seems, however, to be the Arctic portions of North America, where it has been found in abundance from Alaska to the Atlantic coast. By some authors it has been suggested that, the true *exilipes* also occurs through the whole of Siberia and Northern Russia to Finmarken, in Northern Norway, but, as far as I can judge, it has been confounded with a pale northern form of *linaria*, the *A. linaria pallescens* (HOMEY.). (Cf. a paper of mine in "The Auk," 1884, p. 147, "Notes on the genus Acanthis.") In fact, it is almost easier to confound *exilipes* with the non-conspecific *linaria* than with the Greenland form with which it is here considered to rank only as a subspecies; but this statement only relates to the young and immature specimens, and perhaps a few hybrids from places where both species breed in the vicinity of each other, but never to the adults which are easily distinguished by the color of the rump, this being, in *exilipes*, unstriped, pure white, or suffused with a delicate rosy tinge. The size of both species is essentially the same, except that *exilipes* has a much shorter and differently shaped bill, so that pure-bred young may easily be distinguished by a somewhat careful observer. I have, for the preparation of these remarks and of the memoir in "The Auk," quoted above, handled about two hundred and twenty specimens of both forms (not including *holboellii* and *rostrata*), and among the whole lot there was hardly more than one specimen the identification of which gave any *serious* trouble, that being an adult male with red breast, and showing intermediate features suggesting its probable hybrid origin. For more particulars I refer to the tables of dimensions under the next foregoing species.

I can detect no difference in the intensity of the red color of the breast in Asiatic and in American specimens, as I have specimens from both regions, which are colored rather richly, while others show only the faintest possible trace. In fact, I can match all my Bering Island skins with their counterparts from the other side of the Pacific Ocean.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Bill from nostrils.	Wing.	Tail-feathers.	Furcation of tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
92621	1751	Bering Island	Nov. 27, 1882	♂ ad.	128	6.5	71	55	9
92619	1942	......do	Mar. 8, 1883	♂ ad.	123	7	71	57	10
92620	1917	... ..do	Feb. 24, 1883	♂	122	6	73	59	12
92624	1961	......do.	Mar. 22, 1883	♂	132	6.5	71	55	10
92614	1935	......do	Mar. 4, 1883	♂	129	6	74	62	13
		Average of five males			127	6.4	72	57.6	10.8
9262[illegible]	1962	Bering Island	Mar. 22, 1883	♀	122	7	69	55	11
92617	1911	......do	Feb. 18, 1883	♀	126	6.5	71	55	12
		Average of two females			124	6.8	70	55	11.5

No. 92621.—Iris dark brown. Bill orange-yellow, culmen and tip of gonys blackish. Feet blackish brown.

No. 92619.—Extremely fat. Testes swollen. Bill yellow, culmen and gonys horny brownish gray.

No. 92624.—Bill yellow, culmen and anterior half of gonys horny brown.

No. 92617.—Bill pale orange-yellow, culmen, tomia, and gonys dark brownish.

Table of dimensions of specimens of A. exilipes from America.

A.—TYPICAL SPECIMENS FROM THEMACKENZIE RIVER.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Bill from nostrils.	Wing.	Tail-feathers.	Furcation.
						mm.	*mm.*	*mm.*	*mm.*
19686*	B. R. Ross.	171	Fort Simpson, Mackenzie River.	Apr. 30, 1860	♂	6.5	75	61	10
19700†	....do	156	......do	Apr. 28, 1860	♀	6	71	59	11
19684	....do	168	......do	Apr. 28, 1860	♀	6.5	73	59	10
03502	....do	768	......do	Feb. 14, 1861	♀	7	71	56	9

B.—WINTER BIRDS FROM ALASKA.

50000	W. H. Dall.	628	Nulato	Feb. 10, 1867	♂ ad.	6.5	75	61	9
50021	... do	602	......do	Feb. 5, 1867	♂ ad.	6.5	74	59	8
73315	Turner	1610	Fort Yukon	Apr. 8, 1877	♂ ad.	6.5	75	59	10
76840	....do	1061	Saint Michael's	Apr. 19, 1876	♂ ad.	6.5	73	55	9
76846	.. do	1059	......do	Apr. 19, 1876	♂ ad.	7	76	65	10
			Average			6.5	75	60	9
50004	W. H. Dall.	.....	Nulato	Feb. 11, 1867	♀ ad.	7	73	59	11
70838	Turner	1049	......do	Mar. 8, 1876	♀ ad.	7	72	58	8
73310	....do	......	Fort Yukon	Mar. 3, 1877	♀ ad.	7	70	60	10
			Average			7	72	59	10

* Male type.

† Female type.

Table of dimensions of specimens of A. exilipes from America—Continued.

C.—SUMMER BIRDS FROM ALASKA.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Bill from nostrils.	Wing.	Tail-feathers.	Furcation.
						mm.	*mm.*	*mm.*	*mm.*
67816	Turner....	55	Saint Michael's............ ..	July 7, 1874	♂ ad.	7	73	59	10
70847	....do	......	......do......................	June 1, 1876	♂ ad.	7	75	60	10
81362	Bean.......	3752	Chamisso Island	Aug. 31, 1880	♂ ad.	7	72	58	8
86525	McKay	......	Nushagak....................	June 7, 1881	♂ ad.	6.5	72	59	8
88747	Murdoch..	402	Point Barrow	June 16, 1882	♂ ad.	7	71	56	11
88745	....do	486	......do......................	July 3, 1882	♂ ad.	7	71	58	10
			Average	....	....	6.9	72.3	58.3	10
70848	Turner....	......	Fort Yukon..................	May 9, 1876	♀ ad.	7	70	58	11
88746	Murdoch..	390	Point Barrow	June 13, 1882	♀ ad.	7	73	55	9
			Average	....	....	7	71.5	56.5	10

117. Leucosticte griseonucha (Brandt).

1826.—*Passer arctous* var. γ Pall., Zoogr. Ross. As., I, p. 23.

1841.—*Fringilla* (*Linaria*) *griseonucha* Brandt, Bull. Acad. St. Petersb., X, 1841, No. 16, p. 19.—Kittl., Denkw., I, p. 278 (1858).

18—.—? *Montifringilla pustulata* Cab. in Ersch. & Grub. Enc., L. (p. 215).—*Fringilla p.* Kittl., Denkw., I, p. 278 (1858).

1850.—*Montifringilla griseinucha* Bp. & Schleg., Mon. Lox., p. 35, pl. 41.—Finsch, Abh. Nat. Bremen, III, 1872, p. 57.—*Leucosticte g.* Bp., Consp. Av., I, p. 537 (1850).—Cab., Mus. Hein., I, p. 154 (1851).—Baird. B. N. Amer., p. 430.—*Id.*, Trans. Chic. Ac. Sc., I, 1869 (p. 317, pl. xxviii, f. 2).—*Id.*, in Coop. Birds Calif., I, p. 161 (1871).—Dall & Bann., Trans. Chic. Ac. Sc., I, 1869 (p. 282).—Dall, Avif. Al. I. eastw., p. 3, (1873).—*Id.*, Avif. Al. I. west, p. 4 (1874).—Ridgw., Bull. Geol. and Geogr. Surv. Terr., 1875, p. 77.—*Id.*, Nomencl. N. A. B., p. 21 (1881).—Bean, Pr. U. S. Nat. Mus., 1882, p. 148.—Taczan., Bull. Soc. Zool. France, 1882, p. 393.—Nelson, Cruise Corwin, p. 67 (1883).—Dybow., Bull. Soc. Zool. France, 1883, p. 364.—Stejneger, Auk, 1884, p. 82.—*Id.*, Naturen, 1884, p. 34.—Turner, Auk, 1885, p. 157.

1872.—? *Montifringilla speciosa* Finsch, Abh. Nat. Ver. Bremen, III, 1872, p. 60.

1872.—*Leucosticte tephrocotis* var. *griseinucha* Coues, Key, p. 130.—*Id.*, Birds N. West, p. 111 (1874).—*Id.* in Elliott's Aff. Alaska, p. 174 (1875).—B. B. & Ridgw., Hist. N. Am. B., I, p. 508 (1874).—H. W. Elliott, Monogr. Seal Isl., p. 127 (1882).

1875.—*Leucosticte tephrocotis* Harting, Fauna Prybilov, p. 16 (1875).

1843.—*Leucosticte griseogenys* Gould, P. Z. S., 1843, p. 104.

1883.—*Leucosticte brunneinucha* Stejneger, Pr. U. S. Nat. Mus., 1883, p. 71 (*nec* Brandt, (cf. "The Auk," 1884, p. 82)).

Compared with skins from the other Aleutian Islands and from the Prybiloff Islands, my specimens show very little difference. There seems to be a tendency to a darker shade of the brownish and a clearer tint of the gray colors, especially noticeable in the winter specimen, but some summer birds are easily matched by those from the Prybiloff Islands. The bill is, in my birds, just a little larger than usual in the other ones, but the difference is too trifling to be taken into account. I have not mentioned that the birds from the Commander Islands apparently have the rosy color of the rump extending less far on the back, as this difference possibly may originate from a different make of the skins.

This is one of the few true American forms of birds occurring on the Commander Islands, being in Kamtschatka replaced by the entirely different *Leucosticte brunneonucha* (BRANDT), a species I never met with on the island, and which I do not believe occurs there.*

On Bering Island it cannot be said to be numerous, except, perhaps, in a few places where the localities are very favorable, for instance, at a rugged rock, called Kasarma, a little south of Poludjonnaja Seal-rookery. Other places where they have been met with are Kitovaja Nepropusk, about 6 miles northwest of the village, at the steep cliffs near the fishing place Saranna, at Tolstoj Mys, on the southeastern end of the island, and a few similar localities. During winter they were seldom seen, although I do not believe that they had left the island.

Copper Island, being one mass of rugged and cracked rocks and cliffs, with steep, often quite perpendicular, walls jutting up straight out of the ocean, is the favorite haunt of these stone-loving birds, which may be said to be fairly common on that island, occurring in pairs around the whole isle during the breeding season.

In the latter half of June I found the parents feeding their young, and on the 7th of July I shot three full-fledged young at one shot, while they were sitting high up on a rocky shelf, almost invisible on account of their resemblance in color to the stones, crying piteously for food. The nature of the latter may be seen from the contents of the gullets, as stated below under remarks, annexed to the list of specimens obtained. The females had very large "breeding patches," No. 92637 having almost the whole abdomen and breast destitute of feathers.

The "Aleutian Rosy Finch" delights especially in steep and high rocks, especially close to the sea and inaccessible to any other beings than those provided with wings. In fact, I do not think that a single pair breeds in the interior of the islands, but after the young are out, the whole family will often move inland, following the rivulets up to the backbone of the mountains in the search for insects. Thus I met a small troop on the 10th of July, 1883, on Copper Island, pretty near midway between the two shores. The call-note of the young birds was deeper and lower than that of the adults, being almost thrush-like.

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* In my preliminary report of 1882 (Pr. U. S. Nat. Mus., 1883, p. 71), the bird of the islands was erroneously given as *L. brunneonucha*, caused by an oral communication from Dr. Dybowski, that the latter species was the common form, he having in four years only once obtained a single specimen of *griseonucha*, which was a bird mounted for a parlor decoration, in the possession of the company's agent, on Bering Island. Not having my specimens at hand when writing my report, I referred them as above, wrongly enumerating the species of *Leucosticte* as an Old World form.

Many pairs, perhaps most of them, produce two broods in the year, and in the beginning of July, when they had finished the first one, I found several pairs in hot pursuit of their love affairs.

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*
92634	1858	Bering Island	Jan. 8, 1883	♂ ad.	205	40	122	85
89129	1226	Copper Island	June 23, 1882	♂ ad.	204	......	123	85
92635	2096	Bering Island	May 21, 1883	(♂) ad.	(197)	......	120	84
92641	2207	Copper Island	June 29, 1883	♂ ad.	214	38	122	88
92640	2228	......do	July 5, 1883	♂ ad.	213	30	123	88
92637	2205	......do	June 28, 1883	♀ ad.	196	35	111	77
92639	2208	......do	June 29, 1883	♀ ad.	210	34	119	84
92638	2212	......do	June 30, 1883	♀ ad.	200	34	114	79
89130	1473	......do	Ju'y —, 1882	ad.	......	......	124	83
92636	2517	......do	July 11, 1883	ad.	......	......	112	80
92642	2232	......do	July 7, 1883	juv.	209	31	116	85

No. 92634.—Iris dark hazel. Bill orange-yellow, tip of both mandibles blackish. Feet black, both above and below. Stomach filled with coarse sand mixed with a few seeds. Tip of wings reaches tip of outer toe of the legs stretched backwards.

No. 89129.—Iris hazel. Bill brownish black. Feet black, under side of toes with a yellowish tinge. In the stomach small black seeds.

No. 92641.—Bill black; a small faint yellowish spot at base of the tomia of the upper mandible, and another near the base of the gonys.

No. 92637.—Bill horny blackish brown, lower mandible lighter, especially at base tinged with yellowish; angle of mouth and adjoining parts of mandibles pale yellow. Feet black. On abdomen and breast a large, naked patch. Gullet crammed with an enormous mass of food, consisting of (1) several dozens of a Coleopterous insect, and (2) a similar number of larvæ, &c., (3) besides leaves and buds of *Cochlearia*, and (4) some seeds.

No. 92638.—Bill at base of culmen, tomia, and gonys yellowish, the remaining parts olive blackish brown. Gullet filled with leaves of some Ericaceous plant; no trace of insects.

No. 92642.—Iris dark hazel. Bill ochraceous yellow, dusky towards the tip; angle of mouth lighter and brighter yellow. Feet very dark grayish brown.

118. Fringilla montifringilla LIN.

1758.—*Fringilla montifringilla* LIN., Syst. Nat., 10 ed., I, p. 179.—TEMM. & SCHLEG., Fauna Japon. Aves (p. 87) (1847).—MIDD., Sibir. Reise, II, 2 (p. 153) (1853).—KITTL., Denkw., I, p. 321 (1858).—SCHRENCK, Reis. Amurl., I, p. 299 (1860).—SWINH., Ibis, 1861, p. 335.—*Id.*, *ibid.*, 1864, p. 423.—*Id.*, *ibid.*, 1874, p. 160.—*Id.*, P. Z. S., 1862, p. 318.—*Id.*, *ibid.*, 1863, p. 298.—*Id.*, *ibid.*, 1871, p. 385.—RADDE, Reisen Süden Ost-Sibir., II (p. 192) (1863).—WHITELY, Ibis, 1867, p. 201.—DYBOW. & PARVEX, J. f. Orn., 1868, p. 335.—PRZEW., Puteschestvie Ussur. (n. 62) (1870).—FINSCH, Verh. Zool. Bot. Ges. Wien, 1872, p. 261.—TACZAN., J. f. Orn., 1873, p. 91.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, *ibid.*, 1876, p. 199.—*Id.*, Orn. Fauna Vost. Sibir., p. 39 (1877).—*Id.*, Bull. Soc. Zool. France, 1876, p. 179.—*Id.*, *ibid.*, 1879, p. 138.—*Id.*, *ibid.*, 1882, p. 393.—BLAKIST. & PRYER, Ibis, 1878, p. 244.—*Iid.*, Trans. As. Soc. Japan, VIII, 1880, p. 281.—*Iid.*, *ibid.*, X, 1882, p. 172.—BOLAU, J. f. Orn., 1880, p. 125.—*Id.*, *ibid.*, 1882, p. 334.—STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 71.—DYBOWSKI, Bull. Soc. Zool. France, 1883, p. 364.—BLAKIST., Amend. List B. Jap., p. 17 (1884).—*Passer m.* PALL., Zoogr. Ross. Asiat., II, p. 18 (1826).

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*
89018	1043	Bering Island	May 11, 1882	♂ ad.	156	92	67
92631	1666	......do	Nov. 24, 1882	♂ ad.	162	87	63
92628	2106	......do	May 22, 1883	♂ ad.	(156)	89	63
92630	2107	......do	May 25, 1883	♂ ad.	(162)	90	63
92027	2108	......do	May 25, 1883	♂ ad.	(163)	91	65
92032	2109	......do	May 25, 1883	♀ ad.	(153)	84	59
92629	2110	......do	May 25, 1883	♀ ad.	(149)	85	59

No. 92631.—Iris hazel. Bill orange yellow, bluish black at the tip. Feet clear brown.

The Brambling is a regular visitor to Bering Island during the migration in spring and fall, but is never numerous. The few individuals observed mostly kept company with the Longspurs. During the spring of 1883 they were more common and remained longer than usual, on account of the snow covering Kamtschatka, three being shot on the 1st of June.

In size they agree completely with specimens from Western Europe, being perhaps a trifle brighter in color.

119. Chloris kawarahiba (Temm.).

1826.—*Coccothraustes chloris* Pall., Zoogr. Ross. As., II, p. 13 (*part*).

1836.—*Fringilla kawarahiba* Temm., Pl. Col., III, livr. 99, pl. 588, fig. 1.—Temm. & Schleg., Fauna Japon. Aves (p. 89, pl. 49) (1847).—*Chlorospiza k.* Whitely, Ibis, 1867, p. 202.—Swinh., Ibis, 1874, p. 160.—Blakist. & Pryer, Ibis, 1878, p. 244.—*Iid.*, Trans. As. Soc. Japan, VIII, 1880, p. 232.—*Iid.*, *ibid.*, X, 1882, p. 173.—Taczan., J. f. Orn., 1881, p. 185.—*Id.*, Bull. Soc. Zool. France, 1882, p. 394.—Dybow., Bull. Soc. Zool. France, 1883, p. 366.—Blakist., Amend. List B. Jap., p. 62 (1884).

1850.—*Chlorospiza kawariba* Bp., Consp. Av., I, p. 514.—*Ligurinus k.* Cab., Mus. Hein., I, p. 158 (1851).—*Fringilla k.* Kittl., Denkw., II, p. 196 (1858).—*Carduelis k.* Homeyer, J. f. Orn., 1879, p. 174.

The Japanese Greenfinch may occasionally be found on Bering Island as an accidental straggler. A fine male was caught on board the steamer while at sea, between Kamtschatka and the island mentioned, on the 13th of June, 1882.

Another specimen, in a very faded and worn plumage, shot in the beginning of July, 1883, was sent me from Petropaulski, where it is said not to be uncommon, although I never met it there.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*
89017	1203	At sea between Bering Island and Kamtschatka.	June 13, 1882	♂ ad.	151	88	53
92626	2302	Petropaulski	July —, 1883	ad.	......	88	55

No. 89017.—Iris dark brown. Bill flesh-colored with the tip faintly tinged with blue. Feet brownish flesh-color.

120. Carpodacus erythrinus grebnitskii subsp. nov.

1770.—*Loxia erythrina* Pall., Nov. Comm. Petrop., XIV (p. 587, tb. 23, fig. 1) (*part*).—*Pyrrhula e.* *Id.*, Zoogr. Ross. Asiat., II, p. 8 (1826).—Kittl., Denkw., II, p. 197 (1858) (*cf.* Bolle, J. f. Orn., 1859, p. 47).—Midd., Sibir. Reise, II, 2 (p. 150) (1853).—Schrenck, Reise Amurl., I, p. 294 (1860).—Radde, Reisen Süden Ost-Sibir., II (p. 185).—Przew., Putesch. Ussur. (n. 55) (1870).—*Fringilla e.* Kittl., Kupfertaf., p. 23, tb. 32, fig. 1 (1833).—*Carpodacus e.* Bp., & Schleg., Mon. Lox., p. 12 (1850).—Swinh., P. Z. S., 1862, p. 318.—*Id.*, *ibid.*, 1863, p. 299.—*Id.*, *ibid.*, 1871, p. 387.—*Id.*, Ibis, 1863, p. 95.—Taczan., J. f. Orn., 1873, p. 93.—*Id.*, *ibid.*, 1874, p. 336.—*Id.*, *ibid.*, 1881, p. 185.—*Id.*, Bull. Soc. Zool. France, 1876, p. 181.—*Id.*, *ibid.*, 1879, p. 138.—*Id.*, *ibid.*, 1882, p. 394.—*Id.*, Orn. Fauna Vost. Sibir., p. 41 (1877).—David & Oust., Ois. Chine (p. 350) (1877).—Stejneger, Naturen, 1882, p. 181.—Dybowski, Bull. Soc. Zool. France, 1883, p. 366.

1868.—*Carpodacus erythreus* Dyb. & Parvex, J. f. Orn., 1868, p. 335.

I have been obliged to separate this bird as a subspecies, it being distinguishable chiefly by the much brighter red which suffuses the plumage of the red males all over. In brightly colored specimens, for instance the type, the whole upper surface is of a rather bright pomegranate red, being only slightly duller in the scapular region, while the wings and the whole under surface are more or less suffused with rose color, throat and breast being intensely rose red.

The type is U. S. Nat. Mus. No. 89162.

In regard to the above synonymy it must be remarked, that I regard most of the Siberian references as only doubtfully relating to this form. Comparison of material in European collections may decide which references should be eliminated.

There can be no doubt that males of this species breed in the gray plumage. I found these breeding gray males almost as common in Petropaulski as the red ones, their conduct and song being exactly the same as that of the latter, and dissection showed that the genital organs were well developed and fully mature. It seems to be a question whether these mature gray birds will ever assume the red plumage, and I should be most inclined to believe that we have here to do with a kind of dichromatism. The two males here alluded to are very gray and pale, much less tinged with ochraceous olive than a female from India, and they are completely destitute even of the slightest trace of a reddish suffusion anywhere. No. 89164 has among the old bleached and abraded rectrices a new one, unabraded, deeply colored, but of full length, and not so young as to show any trace of the outer follicle from which it sprung. This feather is probably grown out to replace an accidental loss; but if the bird at the following moult was going to assume the red plumage, this feather, I think, would have shown the character of the latter. It is, however, exteriorly edged with greenish yellow without a trace of red.

The same individual shows another peculiarity in the coloring of the tail, as all the old rectrices have the tips decidedly darker, in strong contrast to the remaining part of the feathers, thus forming a well marked terminal band, the more distinct as there is a faint indication of a subapical lighter one. In none of the other specimens is there any similar pattern, nor is it indicated on the new rectrix of the same bird, mentioned above.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Remarks.
					mm.	*mm.*	*mm.*	
92633	2303	Petropaulski	July —, 1883	ad.	......	82	59	Red.
89162	1239	......do	June 6, 1882	♂ ad.	......	81	57	Do.
89163	1244	......do	June 30, 1882	♂	145	84	56	Gray.
89164	1250	......do	July 5, 1882	♂	152	79	56	Do.

No. 89162.—Iris dark hazel. Bill brownish gray; lower mandible light. Feet brownish gray.
No. 89163.—Iris, bill, and feet as foregoing. Testes large, swollen, size of a pea.
No. 89164.—Testes large, well developed.

The Scarlet Rose Finch is one of the commonest summer birds in the vicinity of Petropaulski, where it makes itself conspicuous by its sweet and pleasant song.

In 1883 I did not meet it there at all, as it had not arrived when I left Kamtschatka in the spring, and had already departed when, in the autumn, I once more landed in Petropaulski.

It did not occur on the island during my stay, and no instance of its capture there has been recorded.

Family HIRUNDINIDÆ.

121. Clivicola riparia (Lin.).

1758.—*Hirundo riparia* Lin., Nat. Syst., 10 ed., I, p. 192.—Pall., Zoogr. Ross. As., I, p. 535 (1826).—Midd., Sibir. Reise, II, 2 (p. 189) (1853).—Schrenck, Reise Amurl., I, p. 389 (1860).—Radde, Reisen Süden Ost-Sibir. (p. 281) (1863).—*Cotyle r.* Swinh., Ibis, 1861, p. 328.—*Id.*, *ibid.*, 1863, p. 89.—*Id.*, P. Z. S., 1863, p. 287.—*Id.*, *ibid.*, 1871, p. 346.—Taczan., J. f. Orn., 1872, p. 353.—*Id.*, *ibid.*, 1874, p. 334.—*Id.*, Orn. Fauna Vost. Sibir., p. 20 (1877).—*Id.*, Bull. Soc. Zool. France, 1876, p. 134.—*Id.*, *ibid.*, 1882, p. 385.—Blakist. & Pryer, Ibis, 1878, p. 231.—*Iid.*, Trans. As. Soc. Japan, VIII, 1880, p. 211.—*Iid.*, *ibid.*, X, 1882, p. 139.—Seebohm., Ibis, 1879, p. 30.—Blakist., Amend. List B. Jap., p. 21 (1884).

The Kamtschatkan specimens collected by me agree very well with birds from Western Europe, although being a shade darker. They also agree with them in the extent of the furcation of the tail, the distance between the tips of the longest and shortest tail-feathers being as great as the length of the hind toe *with* claw. In all the American specimens examined by me (sixteen) the same distance is hardly longer than the hind toe *without* claw, this being the case even in specimens from Alaska. It will therefore be well not to unite the two races, the American form being *Clivicola riparia cinerea* (VIEILL.).

List of specimens obtained.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Wing.	Tail-feathers.
					mm.	*mm.*
92692	2304	Petropaulski	July —, 1883	ad.	104	54
92691	2305	......do	July —, 1883	ad.	102	55

It occurs in the vicinity of Petropaulski, but is not, as it would seem, very common. It has been said to visit the island of Bering occasionally, but I have doubts as to the correctness of the statement, as no specimens seem to have been obtained. It is certain that it was not seen there during my sojourn.

Three sets of eggs were obtained, measuring as follows:

U. S. Nat. Mus. No.	Stejneger No.	Diameters.
		Millimeters.
21801	2280	18.25 by 12
		17 by 12.5
		16.75 by 12.75
		17 by 12
		19 by 12.25
21802	2281	17.75 by 12.25
	2282	17.25 by 12.25
21773	2279	18 by 12.5
		17.5 by 12.5
		16.75 by 12.5
		17 by 12.5
		18 by 12.25
		16.25 by 12

All the eggs were very evenly and regularly speckled with minute black dots. These could be washed away completely from the fresh eggs, while now, a year afterwards, they are difficult to remove, if it can be done at all.

122. Chelidon tytleri (JERD.).

1826.—*Hirundo domestica* var. PALL., Zoogr. Ross. Asiat., I, p. 530 (*part*).

1853.—*Hirundo rustica* var. *rufa* MIDDEND., Sibir. Reise, II, 2 (p. 188) (*nec* GMEL.).

1858.—*Hirundo rufa* KITTLITZ, Denkwürd., II, p. 196 (*nec* GMEL.).

1862.—*Hirundo rustica* RADDE, Reise Süden Ost-Sibir. (p. 278) (*nec* LIN.).

1864.—*Hirundo tytleri* JERDON, Birds of India, III, p. 870.

1876.—*Hirundo americana* BLAKIST., Ibis, 1876, p. 331.—BLAKIST. & PRYER, Trans. As. Soc. Japan, VIII, 1880, p. 211 (*nec* WILSON).

1882.—*Hirundo erythrogastra* BLAKIST & PRYER, Trans. As. Soc. Japan, X, p. 139 (*nec* BODD.)—BLAKIST., Amend. List B. Jap., p. 47 (1884).—*Chelidon erythrogaster* STEJNEGER, Pr. U. S. Nat. Mus., VI, 1883, p. 72.

1882.—*Hirundo gutturalis* TACZAN., Bull. Soc. Zool. France, 1882, p. 385 (*nec* SCOP.)—. DYBOWSKI, Bull. Soc. Zool. France, 1883, p. 357.

1883.—*Hirundo saturata* "Stejneger MSS.," RIDGW., Pr. U. S. Nat. Mus., VI, 1883, p. 95.

1885.—*Hirundo rustica* subsp. *tytleri* SHARPE, Cat. B. Brit. Mus., X, p. 140.

A careful comparison with a large series of American specimens of *Ch. erythrogastra* shows the following differences:

1. As will be seen from the tables below, the dimensions agree pretty well, except that the lateral rectrices, although subject to great individual variation, are, on the average, considerably shorter in the American species, while the middle ones are of the same length.

2. The darkest American male is perceptibly paler than even the females of the Kamtschatkan form. In the latter species the color of the chin and throat is as deep as in the most richly colored specimens of the true European *rustica*, and the difference between the color of these parts and that of the breast and abdomen is very slight, and much less abrupt than in *Ch. erythrogastra*, and the trace of the black breast-band is more strongly indicated than in the latter. In *tytleri* the brown of the forehead reaches considerably higher up on the head, and the feathers of the tibia are whitish, strongly contrasted with the rich chestnut-rufous of the abdomen, while in *erythrogastra* they are hardly paler than those of the surrounding parts.

There seems thus to be little need of confounding these two birds, which may be considered distinct species, as no intergradation is known to occur. Nor is it likely that any will be found.

As to the Asiatic relatives of the Kamtschatkan species it may be remarked that Taczanowski describes two different forms, one darker, from Dauria and the Baical, and the other, a paler form, from Amur, Ussuri, and China. From the descriptions given by v. Schrenck, and especially by Taczanowski in J. f. Orn., 1875, p. 244, I have little hesitation in referring the latter to a form very closely allied to the Japanese true

Ch. gutturalis, with which they probably are even identical. I have before me two skins collected by Swinhoe at Amoy, China, in April, 1861, which agree pretty well with the description given by Taczanowski, and on the other hand only differ slightly from Japanese specimens in having the pectoral black band perhaps a little more developed, the chestnut color only forming a patch on the middle of it, not interrupting it. The upper surface has, besides, a faint greenish tinge, only seen in young specimens of the Japanese form (*cf.* Taczanowski: "Der rostliche Fleck auf dem schwarzen Brustbande," and "der schmale grüne Schiller der oberen Theile des Körpers"). The measurements are given below.

Birds from Dauria and Baical, or specimens of Jerdon's *tytleri* (Birds of India, III, p. 870, 1864) never came under my inspection, and the descriptions are extremely meager. The probability is, however, that they are identical with the Kamtschatkan bird. It is difficult to make out from the scanty information if they differ from the latter, but it seems as if they, like the Egyptian *savignii*, have the spots on the rectrices rufous-colored, and a more conspicuous black breast-band. Pallas describes a variety from Eastern Siberia as having "*arcus dilatatus juguli chalybeato-ater, includens aream testaceam ovalem*," and "*macula omnium rectricum, prœter 2 medias, interioris vexilli rhombea, magna, ferrugineo alba.*" This is most probably the Daurian and Baicalian bird, as Taczanowski, in speaking of the lighter colored form (*gutturalis*, see above), says that the latter has "not even a trace of rusty color on the pure white spots of the rectrices," wherefrom we may infer that the specimens of the dark form had such a tinge on those feathers. He also adds that in the light colored form, "the rusty patch on the black breast-band is *as large as* in the Siberian swallows from the above-mentioned localities" (Dauria and Baical). Furthermore, Mr. Blyth, when speaking of *tytleri* (Ibis, 1866, p. 336), compares it with *Ch. cahirica* (=*savignii*), giving as the distinctive character that it "has much less of the black gorget," not mentioning any difference in the color of the spots on the rectrices. The gorget is therefore smaller, but it is evidently there, and this can hardly be said of the Kamtschatkan birds, in which it is barely indicated.*

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*Mr. R. Bowdle Sharpe, after the above was written, has examined the types of *H. saturata*, pronouncing them to be *tytleri*. The reason why I now accept this view as correct is that the National Museum has lately received from Captain Blakiston's collection a specimen obtained at Petropaulski which has the white spots on the tail decidedly tinged with rufous. See also further on under "Conclusions."

Tables of dimensions.

Aa.—CHELIDON ERYTHROGASTRA ♂.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Longest tail-feather.	Shortest tail-feather.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
6019	Heerman	......	Sacramento, Cal	......	♂ ad.	......	128	107	42
11008	Drexler	378	Fort Bridger, Utah	May 19, 1858	♂ ad.	......	126	95	43
45932	Bishoff	......	Sitka, Alaska	June —, 1866	♂ ad.	......	119	77	40
54440	Dall	1741	Kutlut, Alaska	June 22, 1868	♂ ad.	......	122	94	43
65481	Herendeen	42	Unalashka, Alaska	June 9, 1873	♂ ad.	......	123	100	44
Average measurements of five males					......	......	124	95	42

b.—CHELIDON ERYTHROGASTRA ♀.

2191	Baird	2191	Carlisle, Pa	May 1, 1845	♀ ad.	......	121	71	42
65482	Herendeen	28	Unalashka, Alaska	June 7, 1873	♀ ad.	......	118	78	41
77185	Smith	158	Cook County, Illinois	May 13, 1870	♀ ad.	......	113	81	40
70879	Turner	......	Saint Michael's, Alaska	June 22, 1876	♀ ad.	......	119	79	40
88329	Wells	......	Grenada, W. I	Apr. 3, 1882	♀ ad.	......	112	70	39
Average measurements of five females					......	......	117	76	40

B.—CHELIDON GUTTURALIS.

37749	Swinhoe	......	Amoy, China	Apr. —, 1867	......	......	114	88	40
37834	.....do	......	......do	Apr. —, 1867	......	......	117	96	41

C.—CHELIDON TYTLERI.*

89165†	Stejneger	1234	Petropaulski, Kamtschatka.	June 28, 1882	♂ ad.	192	118	102	38
89166†	.....do	1235	......do	June 28, 1882	♀ ad.	175	116	87	41
92694	.....do	2296	......do	Aug. —, 1883	(♂) ad.	......	124	116	41
92693	.....do	2297	......do	Aug. —, 1883	(♀) ad.	......	119	82	44
Average measurements of two males					......	......	121	109	40
Average measurements of two females					......	......	118	84	42

*In most cases the right lateral tail-feather is longer than the corresponding rectrix on the left side. Here the measurements of the longest one is invariably given, as also in the tables above.

The Brown-bellied Swallow breeds abundantly in and about Petropaulski, where I met it during the months of June and July, 1882. When, in 1883, I left the town, on one of the latter days of May, they had not yet arrived from the south, and at my arrival there again in the middle of September the last one had already disappeared, so that their whole sojourn lasts less than three months. Mr. Joseph Lugebil has kindly informed me that the swallows arrived on June 3, and disappeared August 19.

During the migration in spring a few stragglers sometimes pay a flying visit to Bering Island. Thus two were reported from the North Rookery on June 19, 1883, and another was observed at Ladiginsk three days later.

A single egg left in the nest was procured in the fall. It was white, heavily spotted with lilac and sepia brown, resembling those of *Ch. erythgastra* and *rustica*. The dimensions are 18 by 13.5^{mm}.

Family MUSCICAPIDÆ.

123. Butalis sibirica (Gmel.).

1788.—*Muscicapa sibirica* Gmel., Syst. Nat., I, 2, p. 936.—Schrenck, Reise Amurl., I, p. 377 (1860).—Radde., Reisen Süden Ost-Sibir. (p. 271), (1863).—*Hemichelidon s.* Swinh., P. Z. S., 1863, p. 288.—*Id.*, *ibid.*, 1870, p. 244.—Bolau. J. f. Orn., 1880, p. 122.— *Butalis s.* Swinh. P. Z. S., 1871, p. 379.—Taczan., J. f. Orn., 1872, p. 446.—*Id.*, *ibid.*, 1875, p. 249.—*Id.*, Bull. Soc. Zool. France, 1876, p. 168.—*Id.*, Orn. Fauna Vost. Sibir., p. 31 *ter.* (1877).—(?) Blakist. & Pryer, Ibis, 1878, p. 234.—*Id.*, Trans. As. Soc. Japan, X, 1882, p. 148.—Dybowski, Bull. Soc. Zool., France, 1883, p. 362.—Seeb., Ibis, 1884, p. 37.—Blakist. Amend. List B. Jap. p. 50 (1884).

1826.—*Muscicapa fuscedula* Pall., Zoogr. Ross. As., I, p. 462.—Dybow. & Parvex, J. f. Orn., 1868, p. 333.

1853.—*Muscicapa pondiceriana* Midd., Sibir. Reise, II, 2 (p. 188).

1858.—*Muscicapa infuscata* Kittl. Denkw., II, p. 197 (*nec* Hartl.) (*cf.* J. f. Orn., 1859, pp. 48 and 51).

1867.—*Muscicapa cinereoalba* Whitely, Ibis, 1867, p. 199 (*nec* Temm. & Schleg.).

The great "bird-wave" of the spring of 1883 caused one morning the whole northern part of Bering Island to swarm with these inhabitants of the mosquito-suffering Kamtschatka. During two weeks they could be met with everywhere, but especially in deep ravines or between the sand dunes, in fact, in all places sheltered from the chilling "norther." Always in movement, flitting from one dry stalk of the large *Archangelica officinalis* to another, or from cluster to cluster of the yellow flowers of the lovely *Rhododendron chrysanthum*, their small parties of four to six individuals gave the otherwise uninviting places a new attraction. Not only was their *'st, 'st*, and *chee-rrek tek, tek!* heard in the immediate neighborhood of the village, but all over the northern portion. A few extracts of my journal will give an idea of this phenomenon, which, during the spring of 1883, made Bering Island a sort of Heligoland from an ornithologcial point of view. Under June 8, I find: "A large number of gray Fly-catchers must have arrived yesterday or last night, as six specimens were shot to-day and at least ten or twelve observed. Yesterday the wind was south, changing during the night to east, variable in force from very light to fresh." The following day I saw at least nine and shot five. The 10th two were shot and several seen. Counted more than twenty on the 11th; shot but four. And thus some were observed almost every day until the 21st, when the last was seen and shot. It may be, however, that several lingered around the shores of the island for a still longer time, as a few days afterward I left Bering Island in order to visit Copper Island.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*
92543	2140	Bering Island	June 8, 1883	♂ ad.	140	17	85	55
92545	2142	......do	June 8, 1883	♂ ad.	138	17	83	54
92538	2150	......do	June 9, 1883	♂ ad.	133	18	79	54
92546	2154	.....do	June 10, 1883	♂ ad.	138	17	82	54
92542	2161	......do	June 11, 1883	♂ ad.	137	20	82	53
92547	2169	......do	June 12, 1883	♂ ad.	141	21	84	57
92540	2135	......do	June 8, 1883	♀ ad.	131	15	82	51
92537	2139	......do	June 8, 1883	♀ ad.	137	20	80	54
92536	2138	......do	June 8, 1883	♀ ad.	135	17	82	54
92541	2144	......do	June 8, 1883	♀ ad.	136	19	79	51
92539	2145	......do	June 9, 1883	♀ ad.	136	21	82	54
92544	2155	......do	June 10, 1883	♀ ad.	133	16	79	53
92535	2180	......do	June 7, 1883	♀ ad.	133	16	83	51
	Average measurements of six males				138	18	82	54
	Average measurements of seven females				134	18	81	52

No. 92543.—Iris dark brown. Bill horny brownish black, below at base yellowish gray: angle of mouth yellow. Feet dark grayish brown; toes below yellow. Testes large, swollen.

No. 92545.—Colors similar. Testes large, swollen.

No. 92541.—Ova small, not swollen.

No. 92535.—Eggs small.

From the table above it will be seen that the difference in size between the two sexes amounts almost to nothing. The difference in color is also very inconspicuous, the females, on the average, being a shade darker than the males.

124. Erythrosterna albicilla (Pall.).

1826.—*Muscicapa albicilla* Pall., Zoogr. Ross. As., I, p. 462, tb.—*Erythrosterna albicilla* Swinh., P. Z. S., 1862, p. 317.—*Id.*, *ibid.*, 1871, p. 380.—David & Oust., Ois. Chine (p. 120, pl. 79) (1877).

1837.—*Muscicapa leucura* Swains., Nat. Hist. Flycatch., p. 253 (*nec* Gmel.).—*Erythrosterna l.* Swinh., Ibis, 1860, p. 357.—*Id.*, *ibid.*, 1863, p. 92.—*Id.*, *ibid.*, 1870, p. 247.—*Id.*, P. Z. S., 1863, p. 290.—*Id.*, *ibid.*, 1871, p. 380.—Taczan., J. f. Orn., 1872, p, 448.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, Orn. Fauna Vost. Sibir., p. 31, *ter.* (1877).—Dybowski, Bull. Soc. Zool. France, 1883, p. 362.

1858.—*Muscicapa parva* Kittl.. Denkw., II, p. 308 (*nec* Bechst.) (*cf.* Hartl., J. f. Orn., 1859, p. 50).—Schrenck, Reise Amurl., I, p. 374 (1860).—Radde, Reisen Süden Ost-Sibir. II, (p. 267) (1863).—Dybow. & Parvex, J. f. Orn., 1868, p. 333.

1860.—*Thamnobia niveiventris* Swinh., Ibis., 1860, p. 54.

1861.—*Erythrosterna mugimaki* Swinh., Ibis, 1861, p. 330 (*nec* Temm. & Schleg.).

1881.—*Muscicapa luteola* Bolau, J. f. Orn., 1881, p. 56 (*nec* Pall.).

The White-tailed Flycatcher was not seen by me in the vicinity of Petropaulski, but occurs, without being very common, however, in the woods farther in the interior.

When, in the spring of 1882, I returned to Bering Island from a short trip to Petropaulski, on the steamer Alexander II, a fine male of this bird was caught alive on board, 50 miles off the shore of Kamtschatka. Curious enough, a female of the same species was shot on Bering Island at Ladiginsk that same morning, and brought to me upon my arrival. It is the only one from the island, where, of course, it is but a casual visitor.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*
92548	2064	Fifty miles off Kamtschatka	May 29, 1883.	♂ ad.	135	26	69	52
92549	2065	Bering Island	May 20, 1883.	♀ ad.	124	......	64	47

Iris dark brown. Bill and feet black.

Family MOTACILLIDÆ.

125. Anthus gustavi Swinh.

1860.—*Anthus arboreus* var. G. R. Gray, P. Z. S., 1860, p. 350.

1863.—*Anthus gustavi* Swinhoe, P. Z. S., 1863, p. 90.—*Id.*, Ibis, 1874, p. 442.—Seeb., Ibis, 1877, p. 129.—*Id.*, *ibid.*, 1878, p. 341.—Tweed., Ibis, 1877, p. 258.—Sharpe, Ibis, 1879, p. 262.—Blakist. & Pryer, Trans. As. Soc. Japan, X, 1882, p. 153.—*A.* (*Agrodroma*) *g.* Swinh., P. Z. S., 1863, p. 273.—*Corydalla g.* *Id.*, *ibid*, 1871, p. 366.—Taczan., Orn. Fauna Vost. Sibir., p. 28 bis (1877).—*Id.*, Bull. Soc. Zool. France, 1882, p. 389.—*Id.*, Ibis, 1883, p. 575.

1869.—*Anthus batchianensis* G. R. Gray, Handl., I, p. 251.

1873.—*Anthus cerrinus* Taczan., J. f. Orn., 1873, p. 112.

1875.—*Anthus seebohmi* Dresser, Birds of Eur. (pt. xlv).—Finsch, Ibis, 1878, p. 58.

1883.—*Anthus* sp. STEJNEGER, Pr. U. S. Nat. Mus., 1883, p. 71.

1883.—*Anthus japonicus* (?) RIDGW., Pr. U. S. Nat. Mus., 1883, p. 95, (*nec* TEMM. & SCHLEG.).

1883.—*Anthus stejnegeri* RIDGW., Pr. U. S. Nat. Mus., 1883, p. 95.—*Id.*, *ibid.*, p. 369.

1883.—*Pipastes agilis* DYBOWSKI, Bull. Soc. Zool. France, 1883, p. 361 (*nec* SYKES, *nec* SWINH. !).

Anthus stejnegeri shares the fate of *Anthus seebohmi.* As the gentleman in honor of whom the latter name was given was compelled to reduce it to a synonym of *Anthus gustavi*, so will I have to reduce the name given in honor of me to a synonym of the same species. Well, it is a funeral, but it is for the benefit of all concerned, and therefore we are not very sorry for it. But these and many other funerals could have been avoided, if the first describers of a species had used such terms for the colors they intended to indicate, as would enable other people to recognize the bird from their description. It very often happens that in a diagnosis the author says chestnut where he ought to have used rusty, buff, or some similar term. Is it too much to ask that a man who introduces a new name into science should know the names of the colors? As the earlier descriptions of this species are more or less defective, and especially so the original description of Swinhoe, I think it advisable to reprint here Mr. Ridgway's careful and detailed description (Pr. U. S. Nat. Mus., 1883, p. 95), from specimens collected by me on Bering Island.

Adult, summer plumage: Above light raw-umber brown, very distinctly streaked with black, these markings broadest on the back, the exterior feathers of which have the inner webs chiefly dull whitish, producing, when the feathers lie in natural position, a distinct stripe on each side of the interscapular region; scapulars much less distinctly streaked with dusky, and without light edgings; middle wing coverts dusky, broadly and very distinctly streaked with brownish white; greater coverts more narrowly tipped with brownish white or very pale buff, and edged with light brown; remiges dusky, edged with light brown; middle rectrices similar, but others dusky, the outer pair mostly dull brownish white, or pale dull buff, with a dull brownish dusky space along edge of basal half of inner web; next feather with the outer web pale dull brownish buff, and the inner web with the terminal portion and stripe along shaft, nearly to the base, of the same color. Lower parts buffy white, the whole jugulum yellowish buff, of varying intensity, and distinctly, though not always sharply, streaked with dull black; superciliary stripe and side of head generally pale buff, the auriculars more brownish, especially along upper margin, where sometimes streaked with dusky; a small dusky spot immediately in front of eye, and throat sometimes bordered along each side by an interrupted series of narrow blackish streaks (these usually, however, nearly or quite obsolete); sides and flanks steeaked with blackish, and longer lower tail-coverts also sometimes streaked. First, second, and third quills longest, and nearly equal (first, however, usually longest), fourth decidedly (.15 of an inch or more) shorter.

The most characteristic feature of this bird, and especially strongly marked in the living bird, the feathers of which are not out of their proper places as in the skinned specimens, are the two distinct stripes on each shoulder, the outer one black, the inner yellowish white, caused by one row of feathers on the shoulder having the outer and inner webs thus differently colored. Equally well marked is a round black spot on each side of the neck, which in the skin is dissolved into a cluster of smaller dark spots, but which in the living bird run together into a solid-patch.

To the remarks of Mr. Ridgway I have nothing to add, except that the individual variation is still larger in the series collected during the second summer. No. 92666 is especially conspicuous for the rich deep buff of the under tail-coverts and the outer rectrices. In none of the specimens, however, occurs a color which, even approximately, can be called "chestnut."

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.*	Tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*
88990*	1118	Bering Island	May 30, 1882	♂ ad.	166	......	85	59
88991*	1119	......do	May 30, 1882	♂ ad.	165	......	83	60
88989*	1174	......do	June 6, 1882	♂ ad.	162	......	85	58
89134*	1211	Copper Island	June 18, 1882	♂ ad.	172	......	85	60
92666	2121	Bering Island	June 4, 1883	♂ ad.	164	33	86	61
92668	2126	......do	June 4, 1883	♂ ad.	163	34	85	59
92673	2131	......do	June 7, 1883	♂ ad.	157	31	81	57
92671	2151	......do	June 9, 1883	♂ ad.	161	27	84	57
92672	2160	......do	June 11, 1883	♂ ad.	169	33	85	58
92669	2171	......do	June 14, 1883	♂ ad.	157	28	82	57
92670	2177	......do	June 15, 1883	♂ ad.	170	34	84	59
92665	2221	Copper Island	July 7, 1883	♂ ad.	160	......	83	55
89135*	1231	......do	June 24, 1882	♀ ad.	......	......	79	53
92667	2125	Bering Island	June 4, 1882	♀ ad.	162	32	82	56

* Types of *Anthus stejnegeri* RIDGW.

No. 88990.—Iris dark brown. Bill flesh-color; culmen and tip horny brown. Feet brownish flesh-color.

No. 89134.—Bill blackish brown; basal half of the lower mandible flesh-colored.

Schlegel's Titlark is one of the commonest land birds on the Commander Island,* and may, during the summer months, be found everywhere in the lower places where grass grows abundantly, whether the ground is the swampy tundra or the dry sand dunes; but also on the sloping hillsides, sometimes even on the more elevated *Empetrum* and *Rhododendron* tundra is the "*Inkatschugi*"* of the Copper Islanders to be met with, but never higher up on the mountains.

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* Dr. Dybowski has committed a curious and most serious blunder by confounding this bird with the Tree-pipit. He states that the latter (*P. agilis*) occurs on the islands, while of *A. gustavi* he says, "cette espèce se recontre seulement à Kamtschatka, et n'a pas été trouvée sur les îles." (Bull. Soc. Zool. France, 1883, p. 361.) The fact is quite the reverse.

Rather shy, but always in movement and cheerful, the Titlark makes itself a conspicuous feature, especially on the few sunny days, when, rising high in the air, it trills its very well-meant but rather monotonous and unmelodious song (if this wooden-sounding chirping really can be called a song) while on the wing. Besides this, it has another short song, somewhat like *tsirrrrrr*, *tsip*, *tsip*, *tsip*, and the call-note is a short *tsip*, *tsip!* The warning-cry is similar, but louder and harsher.

The arrival at the islands in spring takes place in the latter part of May, and the pairs soon select their homes and commence the breeding business, and the first eggs in 1883 were obtained as early as the 30th of May; on Copper Island, I met fully-fledged young on the 9th of July, 1883. They do not content themselves with one brood, however, the eggs of the second laying being frequently found in July. The nest which I took on Copper Island, on July 13, had not yet received the full number, as it only contained two fresh eggs.

The nests consist of dry grasses exclusively, and never contained a single feather, in that respect constantly differing from those of *Calcarius lapponicus* and *Plectrophenax nivalis.* The dimensions of the nests average: External diameter, 90^{mm}; internal diameter, 45^{mm}.

The eggs are very much like those of *Anthus ludovicianus*, with the usual great variation, the general coloration showing all shades between olive gray and violet gray. In Nos. 21768 and 21767 the mottlings are evenly distributed all over the egg, while, in 21818 they run together into a ring around the thick end. One egg of the latter set is curiously long and narrow.

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* An Aleut name, as they have no Russian appellation for this bird. On Bering Island, where the Longspur is more conspicuous, the Titlark is simply called "another kind of *tschelutschék*" for distinction.

Dimensions of the eggs.

U. S. Nat. Mus. No.	L. Stejneger No.	Locality.	Date.	Diameters.
				Millimeters.
21767	2259	Glinka, Copper Island	July 13, 1883	20 by 15
21768	2222	Karabelnij, Copper Island	June —, 1883	20 by 15 19.75 by 15
21818	1391	Severnij, Bering Island	July —, 1882	20 by 15 21 by 15 26 by 14 20 by 14.75

126. Pipastes maculatus (Hodgs.).

1844.—*Anthus maculatus* Hodgs., Gray's Zool. Misc. (p. 83).—Brooks, Ibis, 1876, pp. 499 and 504.—Seebohm, Ibis, 1879, p. 34.—Blakist. & Pryer, Trans. As. Soc. Japan, VIII, 1880, p. 219.—*Iid.*, *ibid.*, X, 1882, p. 153.—Stejneger, Naturen, 1884, p. 6.—Blakist., Amend. List B. Jap., p. 52 (1884).

1847.—*Anthus arboreus* var. Temm. & Schleg., Fauna Japon. Aves (p. —, pl. 23).—Dybow. & Parvex, J. f. Orn., 1868, p. 334.—Bolau, J. f. Orn., 1881, p. 56.—*Anthus arboreus* Middend., Sibir. Reise II, 2 (p. 163) (1853).—Kittl., Denkw., I, p. 335 (1858).—Schrenck, Reise Amurl., I, p. 335 (1860).—Radde, Reisen Süden Ost-Sibir. (p. 223) (1863).—Przew., Putesch. Ussur. (p. 37) (1870).

1860.—*Anthus agilis* Swinh., Ibis, 1860, p. 55 (*nec* Sykes qui *A. trivialis* L.).—*Id.*, *ibid.*, 1861, pp. 36, 333.—*Id.*, *ibid.*, P. 1863, p. 310.—*Id.*, P. Z. S., 1863, p. 273.—Stejneger, Naturen, 1882, p. 182.—*Pipastes a.* Swinh., Ibis, 1870, p. 347.—*Id.*, *ibid.*, 1871, p. 366.—*Id.*, *ibid.*, 1877, p. 144.—Taczan., J. f. Orn., 1873, p. 84.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, *ibid.*, 1875, p. 194.—*Id.*, *ibid.*, 1881, p. 183.—*Id.*, Bull. Soc. Zool. France, 1876 p. 159.—*Id.*, *ibid.*, 1878, p. 136.—*Id.*, *ibid.*, 1882, p. 389.—*Id.*, Orn. Faun. Vost. Sibir., p. 29 bis (1877).—David & Oust., Ois. Chine (p. 308) (1877).—Seeb., Ibis, 1879, p. 34.

1883.—*Anthus gustavi* Dybowski, Bull. Soc. Zool. France, 1883, p. 361 (*nec* Swinh.).

The Tree-pipit is one of the commonest summer birds on the birch-clad heights surrounding Petropaulski. Its chirping note is heard everywhere. This noisy fellow is a great annoyance to the ornithologist, who cautiously creeps along the shrubberies and bushes, as its anxious cry warns the nobler game he watchfully pursues, like the gulls on the sea-shore, who often frustrate the prettiest scheme of the gunner by their malicious outcry.

In 1883 I noted its arrival at, and departure from Petropaulski. The first birds arrived during the 23d of May. Next morning they were already heard singing in several places, and some specimens were secured. In the autumn the last one was seen on one of the last days of September.

None were seen on the islands.

As a good and detailed description of this bird in summer plumage is difficult to find in the literature, I have thought it useful to present the following one, originally prepared by Mr. Robert Ridgway:

♂ *ad., summer plumage, U. S. Nat. Mus. No.* 89152; *L. Stejneger, No.* 1238. *Petropaulski, Kam., June* 29, 1882.

Pileum grayish brown (more fulvous anteriorly), distinctly streaked with black, the series of streaks along each side of crown much the broadest; nape, back, scapulars, rump, upper tail-coverts and middle pair of tail-feathers uniform brownish gray; the feathers of the back, also the longer upper tail-coverts, with very indistinct darker shaft-streaks, the rump tinged with light olive green; wings brownish gray, but decidedly tinged with yellowish olive, especially on outer edges of primaries and their coverts; middle coverts blackish dusky (in distinct contrast with prevailing color of wing), broadly margined terminally with dull whitish; greater coverts also blackish centrally, but this mostly concealed, and the tips of the feathers somewhat lighter than their edges, but not sufficiently so to produce a distinct bar. A distinct superciliary stripe of dull buffy whitish, bordered below by a dusky loral and postocular line; a broad and continuous malar stripe reaching to side of neck, with whole chin and throat absolutely immaculate buff, the throat bordered on each side by a submalar black streak, broken posteriorly into rather sparse specks; jugulum fainter buff, but this soon fading into dull white on breast and other lower parts; entire jugulum and upper breast very heavily spotted with brownish black, their markings beginning very abruptly (with a concave outline) and continued backward along the sides, but becoming gradually narrower, until on the flanks they form narrow and rather indistinct streaks; whole belly, anal region, and crissum absolutely immaculate. Rectrices (except middle pair) brownish dusky, the outer pair with most of the outer web and a considerable portion of the inner web (extending along shaft for about 32mm), the next with a terminal spot only about 10mm long, the other rectrices without whitish on inner webs; outer webs of all strongly tinged with olive yellow toward bases.

First, second, third, and fourth quills longest, and very nearly equal, and reaching about 10mm beyond tips of tertials.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*
89152	1238	Petropaulski	June 29, 1882	♂ ad.	162	......	84	64
92663	2054	......do	May 24, 1883	♂ ad.	167	30	87	62
92664	2298	......do	July —, 1883	ad.	......	......	86	65

No. 89152.—Iris dark brown. Bill horny brown, lower mandible at base, and angle of mouth, flesh-colored. Feet brownish flesh-color.

No. 92663—Iris dark brown. Upper mandible and tip of lower mandible horny blackish brown, basal part of the latter flesh-colored. Feet light grayish flesh-color, joints a little darker. Testes large, swollen

It will be seen that the above measurements do not differ from those of *P. trivialis* (LIN.).

127. Budytes flavus leucostriatus (HOM.).

1826.—*Motacilla flaveola* PALL., Zoogr. Ross. As., I, p. 501 (*part*).

1853.—*Motacilla flava* MIDD., Sibir. Reise, II, 2 (p. 168).—SCHRENCK, Reise Amurl., I, p. 345 (1860).—RADDE, Reisen Süden Ost-Sibir., II (p. 229) (1863).—ADAMS, Ibis, 1878, p. 423.—BOLAU, J. f. Orn., 1880, p. 120.—*Id.*, *ibid.*, 1882, p. 333.—*Budytes f.* SWINH., Ibis, 1861, p. 411.—*Id.*, *ibid.*, 1862, p. 260.—*Id.*, P. Z. S., 1863, p. 274 (*part*).—*Id.*, *ibid.*, 1871, p. 364.—BAIRD, Trans. Chic. Acad., I, I, 1869 (p. 312, pl. xxx, fig. 1).—DALL & BANN., *ibid.*, I, 1869, p. 227.—FINSCH, Abh. Brem. Nat. Ver., III, 1872, p. 37.—TACZAN., J. f. Orn., 1875, p. 252.—*Id.*, Bull. Soc. Zool. France, 1876, p. 150.—*Id.*. *ibid.*, 1882, p. 389.—*Id.*, Orn. Fauna Vost. Sibir., p. 34.—FINSCH, Verh. Zool. Bot. Ges. Wien, 1872, p. 257.—BEAN, Pr. U. S. Nat. Mus., 1882, p. 147.—STEJNEGER, Natureu, 1882, p. 182.—*Id.*, Pr. U. S. Nat. Mus., 1883, p. 72.—DYBOWSKI, Bull. Soc. Zool. France, 1883, p. 360.—NELSON, Cruise Corwin, p. 62 (1883).—TURNER, Auk, 1885, p. 157.

1878.—*Budytes leucostriatus* HOMEY., J. f. Orn., 1878, p. 128.—TACZAN., Bull. Soc. Zool. France, 1878, p. 128.

1882.—"*Budytes leucostria* HOM.," TACZAN., Bull. Soc. Zool. France, 1882, p. 389.

E. v. Homeyer, in 1878 (J. f. Orn., p. 128), described a specimen from Baikal as *B. leucostriatus*, of which he said that "it is the largest of all the *Budytes*" (ulna 3″ 3‴ = 84$^{\text{mm}}$ and tarsus 11‴ = 28$^{\text{mm}}$). But although these measurements are considerably larger than those of my birds, and though the latter on the whole in many respects differ from his description, I hesitate very little in referring them to this form. Homeyer made up his diagnosis from one specimen only (unfortunately he does not state in what season the bird was collected), and the individual variation among the *Budytes* are so great as to easily account for the differences. I, therefore, think that Taczanowski from whom v. Homeyer received his type specimen is right in referring all the Eastern Asiatic *Budytes* with white superciliary streak to this form to which he also has referred the Kamtschatkan bird.

Looking at the tables below we will find that the dimensions of the specimens collected by me are somewhat inferior to those given by v. Homeyer, but that they agree pretty well with two splendid specimens of the true *flavus* from Germany in the National Museum's collection, except that the bills and toes of the former are considerably larger.

As to the color, it may be remarked that my specimens, in the intensity of the yellow color, come very close to those from Germany, but that the tint of the yellow is somewhat different, being in the latter, especially in one of the specimens, of a rather orange tinge, while in the former the yellow is of a more greenish character, the sides especially being marked with olive. The gray of the upper head is less clear in the Kamtschatkan bird, and the white on the chin is, perhaps, on the whole, of a greater extent; but in this respect there is great variation, specimens of both forms being found quite alike. The character, however, which to me seems worth most consideration, is the decided blackish color of the eye-streak and the ear-patch, these parts being only brownish gray in the European specimen before me.

I have also compared my specimens with a fine series of the Alaskan bird, most of which were collected by Mr. Lucien M. Turner, at Saint Michaels. These are of the same size, having bills and toes somewhat intermediate between the European and the Kamtschatkan examples. In color they are rather duller, especially showing a universal tendency to olivaceous dusky spots on the breast, and although the eye-streak and the ear-patch, on the whole, are as dark as in my birds, still a few show this character less pronounced. It is proper to add that I have seen European specimens which were almost as dull colored as those from Alaska.

While it in some instances might not be safe to refer a specimen to one or the other form without having a series of both forms at hand, or without knowing the locality, still there is enough difference to warrant their subspecific separation. It may, besides, be well to bear in mind the seeming difference of the Kamtschatkan specimens, especially in regard to the longer bill. It is a question well worthy the attention of later investigators and collectors.

List of specimens collected and their dimensions.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Exposed culmen.	Tarsus.
						mm.	mm.	mm.	mm.	mm.	mm.
89148	Stejn.	1253	Petropaulski	July 11, 1882	♂ ad.	173	......	80	69	13	25
89149	..do..	1247	....do	July 4, 1882	♂ ad.	166	......	77	71	13	25
92674	..do...	2072	Bering Island	May 23, 1883	(♂ ad.)	(162)	......	79	70	12	25
92677	..do...	2099	....do	May 24, 1883	(♂ ad.)	(170)	......	81	71	13	25
89150	..do...	1254	Petropaulski	July 11, 1882	♀ ad.	158	......	75	65	13	24
92675	..do...	2098	Bering Island	May 22, 1883	(♀ ad.)	(164)	......	76	66	13	25
92678	..do...	2118	....do	June 3, 1883	♀ ad.	155	39	76	62	13	24
92676	..do...	2156	....do	June 10, 1883	♀ ad.	170	49	76	66	12	25
Average measurements of four males						......	......	79	70	13	25
Average measurements of four females						......	......	76	65	13	24

Dimensions of BUDYTES FLAVUS LEUCOSTRIATUS, *from Alaska.*

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Exposed culmen.	Tarsus.
						mm.	*mm.*	*mm.*	*mm.*	*mm.*
67821	Turner	50	Saint Michael's, Alaska.	July 7, 1874	♂ ad.	(173)	78	69	11	25
70163	...do	......	....do	....	♂ ad.	......	78	66	11	24
70787	....do	1139	....do	June 12, 1876	♂ ad.	......	79	67	11	24
73231	....do	1877	... do	June 1, 1877	♂ ad.	......	79	67	11	24
70788	....do	1140	....do	Junle 2, 1876	♀ ad.	(165)	76	69	11	23
73175	....do	......	....do	....	♀ ad.	......	75	63	12	23
86522	McKay	28	Nushagak, Alaska.	June 20, 1881	♀ ad.	......	72	61	11	24
92078	....do	......	....do	June 28, 1882	♀ ad.	......	73	63	12	26
	Average measurements of four males					......	78	67	11	24
	Average measurements of four females					......	74	64	12	24

Dimensions of BUDYTES FLAVUS.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.	Exposed culmen.	Tarsus.
						mm.	*mm.*	*mm.*	*mm.*	*mm.*
88500	v. Berlepsch.	3461	Kurhesse, Germany.	Apr. 18, 1878	♂ ad.	(168)	76	67	11	23
88501	... do	2205	Hanover, Germany.	June 16, 1876	♂ ad.	(172)	80	73	11	23
	Average measurements of two males					......	78	70	11	23

Budytes leucostriatus is a common breeding bird in the environs of Petropaulski, being found during the months of June and July everywhere on the low marshy grounds surrounding the lakes, fresh-water ponds, and brackish lagoons of the vicinity.

On Bering Island their appearance is only occasional during the spring migration, notwithstanding Dr. Dybowski's statement that they breed there. None were seen in 1882, but in 1883, about the 20th of May, a small flock arrived, of which several were shot for me. It is to be remarked that they had not arrived at Petropaulski on the 27th, in which place the ground was still covered with deep snow, though being situated much more southerly than the island. On Bering Island I now and then saw single individuals until June 10, when I observed two and shot one, at which time all the rest seemed to have left.

The birds shot on the island agree perfectly with those collected on the mainland of Kamtschatka. The Alaskan tribe is not known to migrate southward along the American coast. The probability therefore is that they travel over to the Asiatic side, thus following, in their migration to and from the summer haunts, the route by which they at an earlier date have invaded the nearctic regions. I have evidence at hand that a migration route from the Tschuktschi Peninsula crosses the mainland from Anadyr to the Siberian coast of the Okotsk Sea, thus completely avoiding Kamtschatka. The Alaskan *Budytes* probably follow this route, thus being separated from the Kamtschatkan stock, which probably takes another route. This would account for the difference between the examples as shown above. If this really be the case (and that can only be decided by specimens collected during the migration seasons on the Okotsk coast) the Kamtschatkan bird will have to be recognized as a separate race, as the theory here advanced rests upon the supposition of the Alaskan bird being identical with the form of the Northeastern Siberia.

We have here before us a plain case demonstrating the necessity of recognizing the finest differences between the related forms, if the aim of collecting specimens and studying them is to find out the laws ruling the living nature. If the ornithological system and the ornithological science has for object only the convenience of the museum director in determining the names to be put on the label, then it may be proper and convenient to ignore the finer characters, and throw different forms into the same pot, because it is difficult to trace a sharp line between them, or because there are individuals which the perplexed director does not know how to enter upon the register. But it is time that such an ornithology should be done away with. The birds are not there for the sake of the museums, but the museums for the birds.

128. Motacilla melanope Pall.

1776.—*Motacilla melanope* Pall., Reise Russ. Reich., III, p. 696.—*Id.*, Zoogr. Ross. Asiat., I, p. 500 (1826).—Tweed., Ibis, 1877, p. 310.—Blakist. & Pryer, Ibis, 1878, p. 237.—Seebohm, Ibis, 1879, p. 35.—Stejneger, Naturen, 1882, p. 182.—*Calobates m.* Swinh., P. Z. S., 1871, p. 364.—Tweed., P. Z. S., 1877, p. 546.—*C. melanops* Swinh., Ibis, 1874, p. 157.

1884.—*Motacilla sulphurea* var. *melanope* Seeb., Ibis, 1884, p. 39.

1788.—*Motacilla tschuktschensis* Gmel., Syst. Nat., I, p. 962.

1850.—*Pallenura jarensis* Bp., Consp., I, p. 250.

1853.—*Motacilla sulphurea* Middend., Sibir. Reise, II (p. 168).—Schrenck, Reise Amurl., I, p. 344 (1860).—Radde, Reisen Süden Ost-Sibir., II (p. 227), (1863).—*Pallenura s.* Tacz., J. f. Orn., 1873, p. 82.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, Ornith. Fauna Vost. Sibir., p. 34 (1877).

1847.—*Motacilla boarula* TEMM. & SCHLEG., Faun. Japan, Aves (p. 59) (*nec* SCOP., 1769).—KITTL., Denkw., I, p. 321, 1858.—SWINH., Ibis, 1860, p. 55.—*Id.*, *ibid.*, 1861, pp. 35 and 333.—*Id.*, *ibid.*, 1863, p. 309.—*Id.*, *ibid.*, 1866, p. 138.—*Id.*, P. Z. S., 1863, pp. 274 and 334.—BLAKIST., Amend. List B. Jap., p, 55 (1884).—BLAKIST., Ibis, 1862, p. 318.—DYBOW. & PARVEX, J. f. Orn., 1868, p. 334.—BLAKIST. & PRYER, Trans. As. Soc. Japan, VIII, 1880, p. 220.—*Id.*, *ibid.*, X, 1882, p. 155.—BOLAU, J. f. Orn., 1880, p. 120.—*Id.*, *ibid.*, 1881, p. 55.

1855.—*Pallenura robusta* BREHM, Naumannia, 1855, p. 280.—*Id.*, J. f. Orn., 1857, p. 32.

1875.—*Budytes novæ-guineæ* A. B. MEYER, Isis, Sitzungsber., April, 1875 (fide Salvadori).

Not having sufficient material for determining whether the eastern and the western bird really are separable as races, or not, I leave the name and the synonymy as above, without further remarks, as, in that case, it would be the European bird, to which a trinominal appellation, viz, *M. melanope grisea* (MÜLL.), should be applied.

The Gray Wagtail is a common summer bird round Petropaulski, where it may be met with along all the small creeks and rivulets. They had not made their appearance in 1883 when I left on one of the last days of May, but a few birds were still observed during the first days of October of the same year.

Occasionally this species occurs on Bering Island during the migratory season, and, on account of the extraordinary spring of 1883, they were comparatively numerous during the second week of June. It is even possible that a few of them stopped to breed at some creek in the interior of the southern part, as a young bird was taken on board the steamer Aleksander on the 14th of September when about 20 miles southwest of the island.

They were rather shy and difficult to shoot.

List of specimens.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Remarks.
					mm.	mm.	
89147	1248	Petropaulski..	July 4, 1882	♂ ad.	178	......	Iris dark brown.
92679	2146	Bering Island	June 9, 1883	♀ ad.	178	63	Iris dark brown. Feet grayish brown.
92680	2147	....do	June 9, 1883	♀ ad.	191	65	Feet a little lighter. Eggs swollen.

129. Motacilla ocularis SWINH.

1853.—*Motacilla alba* var. *lugens* MIDD., Sibir. Reise, II, 2 (p. 166) (*nec* KITTL., *nec* SCHRENCK, *nec* TEMM. & SCHLEG.).

1860.—*Motacilla ocularis* SWINH., Ibis, 1860, p. 55.—*Id.*, *ibid.*, 1863, pp. 94, 309.—*Id.*, P. Z. S., 1863, p. 275.—*Id.*, *ibid.*, 1871, p. 364.—TACZAN., J. f. Orn., 1873, p. 82.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, *ibid.*, 1875, p. 252.—*Id.*, Bull. Soc. Zool. France, 1876, p. 150.—*Id.*, *ibid.*, 1882, p. 389.—*Id.*, Orn. Fauna Vost Sibir., p. 33 (1876).—SEEBOHM, Ibis, 1878, p. 345.—*Id.*, *ibid.*, 1883, p. 92.—*Id.*, *ibid.*, 1884, p. 39.—RIDGW., Pr. U. S. Nat. Mus., 1881, p. 414.—*Id.*, *ibid.*, 1883, p. 145 (*part*).—BEAN, *ibid.*, 1882, p. 147.—NELSON, Cruise Corwin, p. 62, pl. (1883).—STEJNEGER, Naturen, 1884, p. 5.—BLAKIST., Amend. List B. Jap., p. 54 (1884).

1871.—*Motacilla baicalensis* var. *temporalis* SWINH., P. Z. S., 1871, p. 363.

On the 10th of June, 1882, I obtained on Bering Island a Gray-backed Wagtail, the sex of which could not be determined, and which at the time was referred to the same species as the other Wagtails (*lugens*), the last of which, in 1883, were observed just a month previous.

This late appearance led to a careful comparison, after my return to Washington, the result of which was that I now consider it to belong to *ocularis*.

As I have only one specimen of the latter species in good summer plumage, it must be admitted that my material has been rather scanty,* but as it agrees pretty closely with my Bering Island bird, not only in size but also in all the other points in which the former differs from typical summer specimens from Kamtschatka, it is thought that the conclusions arrived at are correct. It is next to be remarked that the difference of time between the date of the two birds is only sixteen days, and that the specimens from Kamtschatka selected for the comparison are the gray-backed females, one of which was killed only sixteen days earlier in the season than the Bering Island bird, and furthermore that the specimen of *ocularis* was collected by E. W. Nelson at Plover Bay, on the Tschuktschi Peninsula, and designated as a male† (U. S. Nat. Mus. No. 89676).

As already stated, the specimens from Bering Island and Plover Bay agree completely as to size and coloration,‡ so that any detailed comparison between them is superfluous. In these two specimens the back is "absolutely uniform plumbeous-gray." But placed alongside the Kamtschatkan specimens a brownish tinge is quite perceptible, while in the latter the color is purer bluish and occasionally clouded with blackish, especially on the anterior part of the back, of which black clouding the two supposed *ocularis* have not the slightest trace. A further comparison convinces us that in the latter the black cap is confined to the posterior half of the head and part of the nape, while in the females of *lugens* it occupies also the upper neck. The black of the upper tail-coverts in the latter is likewise not only more extended, but also more intensive in color. Considering the great variation in these birds in the amount of the white on the wing, it would be rather useless to undertake a detailed description of the differences. But it may be stated, however, that, on the whole, the two *ocularis* seem to have the white less developed than is the case in those birds with which they have been compared.

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* I have since had the opportunity of comparing large series and find my conclusions, as set forth in the following, fully substantiated.

† As both sexes of *ocularis* have the back gray in summer, there is no reason for supposing that the determination of the sex of the present specimen is erroneous (*cf.* Ridgw., Pr. U. S. Nat. Mus., 1883, p. 146).

‡ *Cf.* also Ridgway's statement (*l. c.*) that No. 89676 "agrees minutely with No. 88988 in coloration."

The dimensions, as given in the tables below, show that our two birds in question are somewhat intermediate in size between the males and females of *lugens*, as represented by the average measurements on page 291, the tail being perhaps a little longer in proportion to the wing, and it is noteworthy that we find the same relations between the measurements of the two forms as given by Taczanowski (Bull. Soc. Zool. France, 1882, p. 389). It may finally be stated that the bills of the two *ocularis* are somewhat smaller, being on an average 1^{mm} shorter than in the males, and 0.5^{mm} shorter than in the females of the true *lugens*.

These differences, together with the unusual late appearance of the bird, make me believe that I am justified in identifying No. 88988 as belonging to *ocularis*, and not to *lugens*, and it is altogether probable that the differences pointed out above are really diagnostic for separating examples of the former from females of the latter species.*

Dimensions of the specimen collected.

U. S. Nat. Mus. No.	Collector's No.	Collector's name.	Locality.	When collected.	Sex and age.	Wing.	Tail-feathers.
						mm.	*mm.*
88988	1477	Stejneger...	Bering Island...........................	June 10, 1882	? ad.	90	92

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* A straggler was shot at La Paz, in Lower California, by Mr. Belding, on the 9th of January, 1882, and identified by Mr. Ridgway (Pr. U. S. Nat. Mus., IV, p. 414) as *M. ocularis*, a determination which, in my opinion, is undoubtedly correct. I have compared it with fall specimens from Kamtschatka and find it differing in the same manner as above, viz, the back has a much more decided wash of brownish and the bill is absolutely smaller.

Dimensions of M. OCULARIS.

U. S. Nat. Mus. No.	Collector's No.	Collector's name.	Locality.	When collected.	Sex and age.	Wing.	Taill-feathers.
						mm.	*mm.*
21181	γ206	....	China....	....	jun.	94	91
37729	....	Swinhoe ...	Amoy	—— —, 1861	......	85	......
57977	356	Scammon ...	Plover Bay, Siberia	....	......	87	92
89676	1984	Nelson......	......do..........................	June 26, 1881	♂ ad.	90	94

Only one lonely straggler was procured on Bering Island, a full month after the last *M. lugens* had been observed. Neither Kamtschatka nor the islands seem to be in the regular route of this species, as but one specimen is reported from the peninsula by Taczanowski. I myself did not meet it there. See also further on under "Conclusions."

130. Motacilla lugens KITTL.

1826.—*Motacilla albeola* var. PALL., Zoogr. Ross. As., I, p. 507.

1833.—*Motacilla lugens* KITTL., Kupfert., p. 16, tb. 21, fig. 1 (*nec* TEMM. & SCHLEG., Fauna Japon., 1847).—*Id.*, Denkwürd, II, p. 199, and p. 371 (1858).—"ILLIGER" GLOGER, Abänd. Vög., p. 148 (1833).—SEEBOHM, Ibis, 1878, p. 347 (in part only).

1833.—*Motacilla lugubris* GLOGER, Abänd. Vög., p. 148 (*nec* TEMM., 1820).—KEYS. & BLAS., Wirb. Eur., I, p. xlix (1840).—SCHLEG., Rev. Crit., p. 68 (1844) (*part*).—CABAN., Mus. Hein., I, p. 12 (1850).

1844.—"*Motacilla albeola* var. *camtschatca* PALL.," SCHLEG., Rev. Crit., p. 68.—ZANDER, Naumannia, 1858, p. 241.

1850.—"*Motacilla albeola* var. *camtschatica* PALL.," BONAP., Consp., I, p. 250 (*nec* SWINH., 1863, P. Z. S., p. 275, quæ *M. ocularis*).—SCHRENCK, Reise Amurl., I, p. 338 (1860).

1851.—*Motacilla alba lugens* ZANDER, Naumannia, 1851, IV, p. 13.—SCHRENCK, Reise Amurl., I, p. 338 (*nec* MIDDEND.).

1851.—*Motacilla leucoptera* "BREHM," ZANDER, Naumannia, 1851, IV, p. 14.

1863.—*Motacilla ocularis* SWINH., P. Z. S., 1863, p. 275 (*part*).—RIDGW., Pr. U. S. Nat. Mus., VI, 1883, p. 144.

1876.—*Motacilla japonica* BLAKIST., Ibis, 1876, p. 333 (*nec* SWINH.).—BOLAU, J. f. Orn., 1880, p. 119.

1878.—*Motacilla amurensis* SEEB., Ibis, 1878, p. 345, pl. ix.—*Id.*, *ibid.*, 1883, p. 91.—*Id.*, *ibid.*, 1884, p. 39.—BOLAU, J. f. Orn., 1881, p. 55.—*Id.*, *ibid.*, 1882, p. 333.—BLAKIST. & PRYER, Trans. As. Soc. Japan. X, 1882, p. 155.—BLAKIST., Amend. List B. Jap., p. 13 (1884).

1882.—*Motacilla kamtschatica* STEJNEGER, Naturen, 1882, p. 182.—*Id.*, *ibid.*, 1884, p. 5.—*Id.*, Pr. U. S. Nat. Mus., 1883, p. 71.—TACZAN., Bull. Soc. Zool. France, 1882, p. 388.

1883.—*Motacilla blakistoni* SEEB., Ibis, 1883, p. 91.—*Id.*, *ibid.*, 1884, p. 38.

Both v. Kittlitz, 1833, and Temminck, 1840, give Pallas as the authority for the name *Motacilla lugens*, which, by later writers, has been ascribed to Illiger; but, as far as I can detect, neither Pallas nor Illiger have ever published such an appellation, which, probably, is a museum name only.* It will, however, stand on v. Kittlitz's authority, as it is unmistakably based upon the typical Kamtschatkan bird, and both the description and the figure are equally conclusive. That Temminck *afterward* confounded *lugens* with the Japanese species cannot make the name untenable for the species to which it clearly belongs.

It cannot be too often repeated that *M. lugens* TEMM. & SCHLEG. is inapplicable to the Japanese species, as it was given by v. Kittlitz to the quite distinct Kamtschatkan bird fourteen years earlier, and that Swinhoe's name *japonica* must stand for the former.

Various authors have considered the Black-backed Kamtschatkan Wag-tail identical with the Japanese species, while others, *e. g.*, Robert Ridgway, referred it to *Motacilla ocularis* SWINH. It is, however, a distinct form, easily distinguishable in the male summer plumage, although the females and the winter plumage are very difficult to separate from those of *ocularis*.

Little need be said as to its difference from *M. japonica*. The latter species has well-marked black cheeks, white chin, and both males and females have the back black.

On the other hand, it is the unanimous assertion of those who have met *ocularis* in the interior of Siberia and on the Tschuktschi Peninsula, that the males of the latter, even in summer, have a gray back like that of the females, and that they never met a black-backed one. Dr. Dybowski informed me that he has collected numerous specimens of this species in all plumages, but never a male which was not gray, and that he has examined a series of about twenty summer birds, collected in Tschuktschi Land, by the Russian Expedition for observing the Transit of Venus, all of which, both males and females, were uniform gray on the back. It is furthermore stated that the true *ocularis* is a somewhat smaller bird than the Kamtshatkan form, the males being hardly larger than the females of the latter.

The adult males of these three forms, in summer plumage, may, therefore, be distinguished thus:

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* *Cf.* also Seebohm's "Rat-hunting" in Ibis, 1878, p. 349. Seebohm "lost the scent (of *M. lugens* ILLIGER) altogether in Middendorff's 'Sibirische Reise,' p. 166 (1851)." It may, however, be traced back to the same year as "*M. lugens* PALL.," viz, to 1833, when it occurs in Gloger's "Abänd. Vögel," as cited above.

a^1. Cheeks and ear-coverts black. Back black; black of throat not reaching base of bill .... 1, *japonica*.
a^2. Cheeks and ear-coverts white.
b^1. Back black; black of throat reaches base of bill .... 2, *lugens*.
b^2. Back gray; black of throat reaches base of bill .... 3, *ocularis*.

This difference in the color corresponds with the difference in their geographical distribution. From what can be learned from the literature, their occurrence in the summer plumage is about as follows:

1. *M. japonica* in Japan and the neighboring tracts of the mainland.
2. *M. lugens* in Kamtschatka and the adjacent islands; Japan.
3. *M. ocularis*, Baikal, Dauria, and the Tschuktschi Peninsula.

As to the probable differences between the females of *lugens* and the males of *ocularis*, I refer to what is said under the head of the latter species (p. 286), proposing here to give a description of the different plumages of *lugens*:

Old ♂.—U. S. Nat. Mus. No. 92685; *L. Stejneger No.* 2037. *Petropaulski, May* 17, 1883.

Iris blackish brown. Bill and feet black. Second and third primaries equal and longest, first very little shorter, considerably longer than fourth.

Posterior half of head, upper neck, back, and upper tail-coverts glossy black with a bluish tinge, on the left half of uropygium a gray patch, caused by feathers of the winter plumage not yet moulted; the lateral upper tail-coverts with broad white margins on their outer webs. A line through the eye, behind connected with the black of the upper neck, chin (the white at the base of the feather shining through, however,) throat, jugulum, and præpectus are, likewise, black with bluish gloss. Forehead and anterior half of crown, on the sides extended backward into a broad stripe behind and above the eye, further, the malar, subocular, and auricular regions as also the sides of the neck, and finally the lower surface, behind the præpectus, and the flanks pure snowy white, the latter suffused with gray. The wings are remarkable for the great extent of the white color, the four first primaries being wholly white, except for the terminal 25^{mm}, which, together with a narrow stripe on the *outer* web along the shaft, are black, so that more than the basal two-thirds of the inner webs are white from margin to shaft. On the following primaries the black increases on the inner web, while the white edging of the outer one is getting broader. The large arm-coverts, as also the middle-coverts, are pure white, while the primary coverts have a black stripe on the outer web for the basal two-thirds. The lesser wing-coverts are dull black with the exterior edges shaded with gray; under wing-coverts and axillaries pure white. Tibial feathers blackish, the upper ones broadly tipped with white. The three middle pairs of rectrices are deep black, the interior one with a pure white edging on the outer web tapering towards the tip; the two lateral pairs are white with a black edging on the inner webs falling short of the tip, in the external pair by one-third of the feathers' length, in the following by one-sixth.

This is the most developed plumage of the old male, described by Mr. Seebohm as *M. blakistoni*.* The evidence is another male (No. 92684),

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*Mr. Seebohm has added two synonyms to the species in question, describing the middle state as *M. amurensis*, the very old as *M. blakistoni*. When describing the first one he remarks that "in the present condition of ornithological literature, loaded with synonyms, any one who adds a name to the almost exhaustless list is guilty of a crime." We cannot agree with him there. It would have been a much greater shot on the same day, out of the same flock, being intermediate in color between that described and the "*amurensis*" state, as it has much less white on the primaries, a little less on the primary coverts, while the arm-coverts and middle ones are fully as white; the lesser ones are blackish with broader and more distinct gray edges.

Old ♀.—*U. S. Nat. Mus. No.* 92688; *L. Stejneger No.* 2058. *Petropaulski, May* 24, 1883.

Iris very dark brown. Bill and feet black. Primaries exactly as in the male. Ova small.

Differs from the old male, described above, in having the back, including scapulars, plumbeous gray, strongly mottled with black, and more whitish on the chin. The wing-feathers are quite similarly colored, only that the first primary on the basal half of the inner web has some faint dusky mottlings; the wing-coverts are also similar, except the lesser ones, which are gray. The lateral pair of tail-feathers is pure white without black, and the following has the black margin of the same extent as in the lateral pair of the male; the third pair has a small terminal white streak on both sides of the shaft.

This would be the female *M. blakistoni*.

The following plumage is that most commonly met with. I have nothing to add to Mr. Robert Ridgway's descriptions of the specimens brought home by me, which are therefore only reprinted from his article.

Adult ♂.—*U. S. Nat. Mus. No.* 88986; *L. Stejneger No.* 1034. *Bering Island, May* 11, 1882.

Posterior half of crown, with occiput, glossy blue black; back, scapulars, and upper tail-coverts, duller black, the rump mixed black and plumbeous gray; lesser wing-coverts, uniform ash gray. Forehead, anterior half of crown, and broad superciliary stripe, pure white; beneath this, a distinct black line, confluent with the black of the occiput, and extending thence forward along upper edge of auriculars to the eye, and from the latter across lores to the bill, but loral stripe rather indistinct anteriorly; side of head below this black line, pure white; chin also white, but more or less mixed with blackish; throat and jugulum, uniform blue back, with a strongly convex posterior outline; rest of lower parts, pure white, but tinged laterally with bluish gray. Lateral upper tail-coverts with outer webs very broadly edged with white; middle rectrices black, the outer webs distinctly edged with pure white; next three rectrices, on each side, uniform brownish black; two outer rectrices (on each side) pure white, the inner web of the first with or without a very narrow edging of blackish along the middle portion, that of the second with a broader and more extended blackish edging. Exposed portion of middle and greater wing-coverts and outer web

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crime if he had united these birds with other forms, for instance, *japonica* or *ocularis*. As it is he has attracted special attention to these birds, and furthermore, we have his elaborate descriptions and a good plate. I venture to say that on the contrary it has been to the benefit of science, against which the load of the easily-located synonyms is a trifle. It is not this kind of synonyms which is troublesome, but those like *Motacilla lugens* TEMM., *nec* KITTL., *nec* ILLIG., *nec* and so forth, which make gray hairs for the ornithologist. It may here be remarked that the phase "*blakistoni*" has already, in 1859, been described by Zander as *leucoptera* BREHM, "aus Japan. * * * Halsseiten weiss * * * durch die Augen ein schwarzer Streif. * * * Die kleinen Deckfedern der Flügel schwarz, die mittleren und grossen ganz weiss, von den letzteren bloss die erste am Schafte etwas grau," &c. See, however, under "Conclusions," about the possibility of *M. amurensis* being distinct.

of tertials (except first), pure white, appearing as a continuous, unbroken, elongated patch on the closed wing; inner webs of tertials, blackish; secondaries, grayish brown, the outer webs edged with white, but inner webs with no trace of white edging toward ends; primaries and their coverts, with alulæ, also grayish brown (or brownish gray) edged with white. Bill, uniform deep black. Feet duller black. Iris dark brown.

Adult ♀.—U. S. Nat. Mus. No. 88987; *L. Stejneger No.* 2031. *Bering Island, May* 11, 1882.

Similar to the adult ♂ as described above, but nape, back, and scapulars, uniform plumbeous gray, instead of black; chin black.

Specimens in autumnal plumage.—♂.—U. S. Nat. Mus. No. 92689; *L. Stejneger No.* 2597. *Petropaulski, September* 18, 1883.

Iris dark brown. Bill black, yellowish gray on basal half of lower mandible. Feet black.

Differs from the male in summer plumage in having the posterior half of the head and the back gray, the former with a slight yellowish wash and mottled with black; the white parts on the head are also suffused slightly with yellowish; the mentum is white, and the black feathers of the throat narrowly edged with whitish. Remiges and rectrices edged more conspicuously with white.

The female (U. S. Nat. Mus. No. 92690) killed on Staritskof Island, at the entrance of Avatscha Bay, Kamtschatka, September 23, 1883, by L. Stejneger, is similar, but has the yellowish tinge extended over the back, throat, and inner wing-feathers. The black on the throat is still more restricted.

List of specimens collected.

A.—DURING THE MONTHS OF MAY AND JUNE.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.
						mm.	mm.	mm.	mm.
88986	Stejneger	1034	Bering Island	May 11, 1882	♂ ad.	203	......	94	98
88985	....do	1010	.....do	May 9, 1882	♂ ad.	196	......	95	91
89146	....do	1233	Petropaulski	June 27, 1882	♂ ad.	207	......	91	90
92682	....do	2010	Bering Island	May 5, 1883	♂ ad.	202	......	94	97
92683	....do	2030	Petropaulski	May 15, 1883	♂ ad.	208	......	95	97
92684	....do	2036	......do	May 17, 1883	♂ ad.	......	......	97	97
92685	....do	2037	.....do	May 17, 1883	♂ ad.	215	70	97	101
88987	....do	1035	Bering Island	May 11, 1882	♀ ad.	189	......	89	92
92686	....do	2032	Petropaulski	May 15, 1883	♀ ad.	195	63	87	91
92687	....do	2031	......do	May 15, 1883	♀ ad.	192	......	89	88
92688	...do	2058	......do	May 24, 1883	♀ ad.	198	......	90	86
92681	....do	2105	......do	May 22, 1883	? ad.	(200)	......	93	94
	Average measurements of 7 males					205	......	95	96
	Average measurements of 4 females					193	......	89	84

B.—DURING THE MONTH OF SEPTEMBER.

92689	Stejneger	2597	Petropaulski	Sept. 18, 1883	♂ ad.	212	66	96	97
92690	....do	2641	Staritskof Island, Kamtschatka	Sept. 23, 1883	♀	......	......	93	97

The Black backed Kamtschatkan Wagtail is regularly seen on Bering Island during the migration season, usually making its first appearance in the early part of May, disappearing, however, towards the end of the month. They are only seen single, or a few together, and although convenient breeding places and plenty of food might be easily found, still they never remain to rear their young on the stony beaches of the Commander Islands.

Around Petropaulski they are numerous. In 1883 they arrived in the neighborhood later than usual, on account of the deep snow, which covered the country down to the very water's line. The first were seen in that year on the 15th of May, when I shot three out of a small flock of six. But I had already observed the first Wagtail on the much more northerly Bering Island eleven days before. In the autumn of the same year the last one was seen at Petropaulski about the first of October, but most of them had already left more than a week before that time.

In habits and voice it resembles very much the European *M. alba*, but seems to prefer the sea-shore to the banks of the creeks and rivulets which are the favorite resorts of its coquettish cousin, *M. melanope.*

Family TROGLODYTIDÆ.

131. Troglodytes pallescens (RIDGW.).

1882.—*Troglodytes fumigatus?* TACZAN., Bull. Soc. Zool. France, 1882, p. 386 (*nec* TEMM.).
1883.—*Anorthura pallescens* "Stejneger, MSS.," RIDGW., Pr. U. S. Nat. Mus., 1883, p. 93.—*Troglodytes p.* STEJNEGER, Zeitschr. Ges. Orn., I, 1884, p. 11.
1883.—*Troglodytes* n. sp. DYBOWSKI, Bull. Soc. Zool. France, 1883, p. 357.

♂ ad.—U. S. Nat. Mus. No. 88994; L. Stejneger No. 1644. Bering Island, September 20, 1882.

Above dull smoky brown (far less rusty than in *A. alascensis*), uniform on pileum, nape, and upper back, but lower back and rump barred with dusky, the wing-coverts and upper tail-coverts still more distinctly barred with the same; middle wing-coverts tipped with a small deltoid spot of pure white; outer webs of five outer primaries spotted with brownish white, the remaining quills with outer webs plain dull brown. Tail brown, crossed by six or seven rather wide bands of blackish, the last three or four rendered more distinct by a decided lightening of the brown against their posterior edge; on the middle rectrices, however, the bars much less distinct and more irregular. Lores and indistinct superciliary stripe, malar region, chin, throat, jugulum, and sides of breast dull light-brownish buff (much paler and duller than in *A. alascensis*), the middle of breast and upper part of belly much paler, or inclining to brownish white; sides, flanks, and crissum brownish white, broadly and distinctly barred with dusky, the sides more tinged with brown. Auriculars dusky brown, streaked with the color of the throat. Bill brownish black, more brown on lower basal portion of mandible. "Iris dark brown." Legs and feet dark brown. (RIDGW., *l. c.*)

♀ *ad.—U. S. Nat. Mus. No.* 92532; *L. Stejneger No.* 1703. *Bering Island, October* 31, 1882.

Indistinguishable from the male described above, except by being a trifle smaller.

Juv.—U. S. Nat. Mus., No. 92523; *L. Stejneger No.* 2229. *Copper Island, July* 5, 1883.

Head above dark gray with a brownish tinge; loral space blackish; superciliary stripe only recognizable behind the eye; ear-coverts suffused with blackish. Back and rump a shade more rusty than in the adult, the black bars less distinct. Ground color of the lower surface similar to that of the adults, but as the dusky edges of each feather are much broader, the young seems dusky below with spots of pale buff, the throat being almost uniformly suffused with dusky; besides, the flanks and abdomen are more brownish. Wings and tails mostly like those of the adults, the longest tertial having the inner web uniform blackish-brown edged with brownish buff and without cross-marking; the white spots on the smaller wing-coverts less pure.

Troglodytes pallescens needs no comparison with *Troglodytes neglectus* BROOKS, from Cashmere, which has "the entire back from the mantle downwards distinctly barred with dusky blackish, remains of some of these bars even occurring on the hind neck," which has "about twelve bars distinguishable on the centre tail-feathers," and "the throat and chest dusky brown, with blackish cross-bars."

Nor should any comparison with *Troglodytes fumigatus* TEMM. from Japan be necessary. But as the *Troglodytæ* from the Pacific coasts have been sorely confounded by prominent writers, and especially of late by Mr. Taczanowski* it may not be out of place to indicate the differences:

1. *T. fumigatus* is decidedly smaller, with, both absolutely and proportionately, much smaller bill.

2. The general color of *fumigatus* is much darker and richer, both above and below, being in fact one of the deepest colored species of the group, while *pallescens* ranks among the palest and dullest.

3. In *fumigatus* the dusky cross-bars are more distinct and reach further forward, both on the upper and the lower surface, forming very distinct spots on the chest and in some species even on the throat. The bars on the tail are more numerous, and the longest tertiary has the inner web of the same color as the outer web, and is also distinctly barred

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* Since this article was written Mr. H. Seebohm (Ibis, 1884, p. 41) has made a rather curious statement in regard to the forms here mentioned. He said: "To distinguish it [T. parvulus var. fumigatus] even as a variety from *T. alascensis* and *T. pacificus* can only be regarded as hair-splitting, the extremes in a series of any one variety overlapping the extremes of the nearest allied varieties." Not half a year before Mr. Seebohm committed the same "hair-splitting" (Hist. Brit. Birds, I, p. 506), and he does not state how great the additional material is upon which his new discovery is founded. The series of specimens from both sides of the Pacific I have had the opportunity of examining amounts to about sixty, and in view of these Mr. Seebohm's opinion is inexplicable to me. (Cf. what is said below about the intergradation. See also Ridgway's very important article in Pr. U. S. Nat. Mus., 1883, p. 370, on the same subject.)

with blackish dusky. The light spots on the sides of the neck are very pronounced, while only the ear-coverts are perceptibly light spotted in *pallescens*.

It might reasonably have been expected that the Wren occurring on the two westernmost islands of the Aleutian chain should belong to the same species as those inhabiting the other ones, viz, *T. alascensis*. As my friend, Robert Ridgway, however, has already given (*l. c.*) a careful comparison of the two forms, I shall here only repeat the most striking differences between the adults, viz, that *pallescens* has the posterior half of both surfaces distinctly barred with dusky, while in the brighter rusty colored *alascensis* the whole upper surface is quite uniform, *without any trace of bars*, having, besides, a still longer bill.*

The most interesting feature of the two species is perhaps, however, the fact that the young are even more widely distinct than the adults. The young of *alascensis* are of the same general bright rusty color as the adults, with the dusky edgings of the feathers on the lower surface very pale and indistinct, and the crown of the head is not differently colored from the back.

It might be thought impossible that the short-billed, dark-colored *fumigatus* with the very distinct blackish bars should ever have been confounded with the long-billed, bright-colored *alascensis*, which has no cross-bars whatever on the upper surface, but, nevertheless, we often see the latter quoted as a mere synonym of the former, and Taczanowski, in 1881, still maintains that *fumigatus* breeds yearly on the Aleutian Islands (J. f. Orn., 1881, p. 180). For completeness's sake I have therefore appended a second table of dimensions containing the measurements of specimens from the American Aleutians and from Alaska.

It may be stated here that, although I have examined a series of more than forty specimens, I failed to detect any individual presenting intermediate characters. The complete isolation of the habitats of the three forms make their intergradation, *a priori*, more than improbable.

In order to give a true idea of the general color of *pallescens* it may finally be said that it comes very near to pale specimens of *T. troglodytes* from Central Europe, from which it is distinguished by the pattern of the longest tertiary, the markings on the back, the indistinctness of the superciliary stripe, the well-defined light spots on the auriculars, &c., not to speak of differences in the proportions; and from the barred race from Western Norway, which I have called *Troglodytes troglodytes bergensis*, it is, besides, distinguished by its duller color.

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* *Cf.* FINSCH, Abhandl. Nat. Ver. Bremen, III, 1872, p. 31, where he states the reverse. It is to be remarked, however, that his specimen, from Kodiak, is *T. pacificus*, and NOT *T. alascensis*, as he determined it.

I have in another place (Naturen, 1884, p. 34), made the statement that, besides *T. pallescens*, I had obtained a specimen of another *Troglodytes*, which I suspected might be *fumigatus*, referring to what is No. 92534 of the following list. My reason for so thinking was that the bill was differently shaped from that of the other specimens which I had seen, being strongly curved at the tip. The other differences which I indicated vanish upon a close examination, and the curvature of the bill is easily explained by the fact that the tip of the lower mandible is broken off. It certainly belongs to the species here in question.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Exposed culmen.	Tarsus.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
88994	1644	Bering Island	Sept. 20, 1882	♂ ad.	114	......	53	36	13	19
92534	1807	......do	Dec. 12, 1882	♂ ad.	118	......	54	35	14	19
92519	2213	Copper Island	June 30, 1883	♂ ad.	115	25	52	35	14	19.5
92520	2214	......do	July 1, 1883	♂ ad.	117	23	52	34	13.7	18.3
		Average	......	......	116	24	52.7	35	13.7	18.7
92532	1703	Bering Island	Oct. 31, 1882	♀ ad.	106	......	51	35	13	18
92533	1914	......do	Feb. 21, 1883	♀ ad.	114	......	50	34	......	19
92531	2015	......do	May 8, 1883	♀ ad.	113	......	49	35	......	19
92521	2204	Copper Island	June 28, 1883	♀ ad.	113	23	49	34	13	18.5
		Average	......	......	111.5	23	40.7	34.5	13	18.6
89132	1472	Copper Island	July —, 1882	jun.	......	......	51	35	13	19
92523	2229	......do	July 5, 1883	♀ juv.	104	16	48	29	11	18
92529	2230	......do	July 5, 1883	♂ juv.	106	7	50	28	9.7	18.5
92528	2234	......do	July 8, 1883	♂ juv.	116	18	51	32	10.5	19
92524	2273	......do	July 20, 1883	juv.	113	24	50	35	11	19.5
92526	2274	......do	July 20, 1883	♂ juv.	115	23	53	36	11.2	19.2
92525	2275	......do	July 20, 1883	♂ juv.	114	23	54	36	12	18.5
92522	2276	......do	July 20, 1883	♂ juv.	118	28	51	36	11	19
92527	2277	......do	July 20, 1883	♀ juv.	115	25	49	34	11.5	18.8
92530	2286	......do	July 23, 1883	juv.	121	24	52	37	12.7	19.5

No. 88994.—Iris dark brown. Bill blackish brown, at the base of lower mandible lighter, more grayish. Feet brownish gray, darker behind, more yellowish below the toes.

No. 92519.—Bill blackish brown, tomia, base of gonys, and angle of mouth yellowish. Feet light grayish brown, joints darker.

No 92532.—Iris dark brown. Bill blackish brown, basal half of tomia and angle of mouth yellowish. Feet brownish gray. In the stomach remains of spiders and a land snail.

No. 92531.—Feet of a yellowish brownish flesh-color. Extremely fat.

No. 92521.—Feet light and clear grayish brown, joints darker. Not fat. A large naked "breeding patch" on abdomen and breast.

No. 92523.—Iris very dark brown. Bill dark grayish brown, lower mandible pale brownish flesh-color; angle of mouth prominent; bright neaple-yellow. Feet pale brownish gray.

No. 92528 belonged to the same family as Nos. 92523 and 92529.

Table of dimensions.

I.—TROGLODYTES FUMIGATUS Temm.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Wing.	Tail-feathers.	Exposed culmen.	Tarsus.
						mm.	mm.	mm.	mm.
91363	Jouy	787	Tate Yama, Japan	Nov. 17, 1882	♂ ad.	50	37	10.7	17.7
91364	...do	828	......do	Dec. 2, 1882	♂ ad.	51	35	11	17
91366	....do	835	......do	Dec. 4, 1882	♂ ad.	49	36	11	18
			Average	....	.....	50	36	10.9	17.6
91365	....do	834	Tate Yama, Japan	Dec. 4, 1882	♀ ad.	45	32	10.5	15.5
91367	....do	839	......do	Dec. 4, 1882	♀ ad.	47	32	10	16.2
			Average	....	.....	46	32	10.2	15.8
88640	....do	571	Fuji, Japan	July 20, 1882	♂	49	33	10.8	18.5

II.—TROGLODYTES ALASCENSIS Baird.

61330	W. H. Dall	......	Unalashka, Alaska	Oct. 21, 1871	♂ ad.	51	34	15	20
61327	....do	94	Amaknak Island, Alaska	Oct. 22, 1871	♂ ad.	49	35	14	20
61635	....do	288	Iliuliuk, Alaska	Dec. 3, 1871	♂ ad.	49	32	13.5	19.5
68324	Adams	......	Saint George's Island, Alaska	....	♂ ad.	51	36	14	19.5
78508	Nelson	......	Akontan Island, Alaska	May 18, 1877	♂ ad.	52	33	15	19
78867	Turner	173	Alaska	....	♂ ad.	49	32	14	19
78869	....do	175	......do	....	♂ ad.	51	33	15	18.5
78870	.. do	172	......do	....	♂ ad.	51	34	15.5	19
			Average	....	......	50.4	33.6	14.5	19.3
78871	....do	174	Alaska	....	♀ ad.	51	32	14	19.3
81340	Bean	3897	Iliuliuk, Alaska	Oct. 13, 1880	♀ ad.	48	32	14	18.7
						49.5	32	14	19

The natives of the Commander Islands used to call this species, peculiar to the islands, the "*Limaschinka*," which means a little "chew of tobacco," obviously in allusion to its color, size, and shape.

On Bering Island the Limaschinka is rather scarce, but it is said that it was a common bird along its rocky beaches not many years ago. It seems probable that the growing multitude of the red *Arvicola* is the cause of the diminution. An argument in favor of this opinion is the fact that the only place where the bird is still found in proportional abundance is on the small islet Toporkoff, where the *Arvicola* has not yet made its appearance, nor have its numbers diminished on Copper Island, where it is still common, and where there are no field-mice to disturb it.

In general manners of movement, flight, &c., it closely resembles the *T. hiemalis* and *T. troglodytes.* It is, however, strictly confined to the rocks, particularly the steep rugged walls near the shore, and they are frequently met with among the large stones close to the water's line. It creeps among the rocks in search of its food, and builds its nest and rears its young in a deep hole or crack, usually where the stone is most weathered and brittle, but always so that it is safe from anything larger than a mouse and which cannot fly. I knew of several holes in which there were nests, but it was, in every case, quite impossible to get at them. Its voice is agreeable and vigorous, remarkably so compared with the size of the bird. Like that of *T. parvulus*, it has a great resemblance to the song of the canary, but it differs from that of the European species in being of a somewhat higher and more metallic sound.

It is needless to remark that the bird is a resident on the island.

Family PARIDÆ.

132. **Parus kamtschatkensis** (Bonap.).

1826.—*Parus carbonarius* Pall., Zoogr. Ross. As., I, p. 556 (*part*).
1826.—*Parus palustris* Pall., Zoogr. Ross. As., I, p. 557 (*part*).
1850.—*Pœcila kamtschatkensis* Bonap., Consp. Av., I, p. 230 (*nec* Taczan., 1872, &c., *nec* Seeb., *nec* Blakist.).—Kittl., Denkw., I, p. 321 (*cf.* Bolle, J. f. Orn., 1859, p. 47).—Taczan., Bull. Soc. Zool. France, 1882, p. 390.—Dybowski, Bull. Soc. Zool. France, 1883, p. 361.—*Parus k.* Madarasz, Zeitschr. Ges. Orn., I, 1884, p. 77, pl. iv.
1880.—*Parus wiemuthi* Dybowski, MSS.

This bird is a most elegant and distinct species, as already remarked by Bonaparte. It is rather strange that Taczanowski and others could apply the name *kamtschatkensis* to the northeastern form of *borealis*, as Bonaparte (*l. c.*) describes it as "*albo-canescens*," while Taczanowski himself states that his birds were "schiefer-aschgrau," slaty ash-colored. It is one proof more that it usually promotes more confusion to adopt an older name, the description of which does not exactly fit, than to give a new name, which may later turn out to be a synonym. The *Pœcile*[*] *kamtschatkensis* of Taczanowski should stand as *Parus baicalensis* (SWINH.), Ann. Mag. Nat. Hist., 1871 (p. 257).[†]

Parus kamtschatkensis BP. is one of the most striking looking birds in the group of the Chickadees. Its light color looks almost pure white when the lively fellow, busily engaged in the search for insects at the end of the green branches, flits from birch to birch, and the pretty black cap gives it a most exquisite appearance.

In spring and summer they were rather scarce, and, therefore, I suppose them to breed only in the pine woods, but during my stay in Petropaulski, in September and October, I found them numerous in all the birch and elder groves of the surroundings. They were usually met in small flocks of from four to ten individuals, rapidly passing through the woods, announcing their approach by the vigorous call-note by which the troup managed to keep together. Whenever any of them had been too deeply absorbed in the search for food or in a struggle with a big spider, and found himself left behind, he would sing out an anxious and inquiring *tæ, tǣ*, which immediately was answered by one or more of his comrades with a similar but more rapidly uttered sound, if within hearing range, whereupon he, with a satisfied *tǣ, tæ·æ̆-æ̆-æ̆-æ̆!*, would hurry off to join them. In all the numerous flocks I met there never was a single bird of a different kind.

No specimen of this bird has been obtained from the islands, but it may sometimes be met with as a straggler from Kamtschatka. The Cossak, Aleksander Selivanoff, on the 4th of May, 1883, informed me that in the neighborhood on the village on Bering Island he had seen a small bird of the size of a Red-poll, but quite white, and with a black head. While he was fetching his gun, in order to secure it for me, it disappeared. It can hardly have been any other bird than the Kamtschatkan Chickadee.

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[*] Taczanowski writes *Pœcilia*, but *Pœcile* is the original spelling of Kaup. Besides, *Pœcilia* is preoccupied in 1801 for a fish and in 1802 for a lepidopterous insect. I have been unable to find any structural character which will separate these birds from *Parus*.

[†] The synonymy would then be: *Pœcilia kamtschatkensis* TACZAN., J. f. Orn., 1872, p. 443 (*nec* Bp., *nec* BLAKIST., *quæ japonica*).—*Id.*, Orn. Fauna Vost. Sibir., p. 33 bis (1877).—*Id.*, Bull. Soc. Zool. France, 1876, p. 163.—*Parus palustris* subsp. *camtschatkensis* SEEB., Ibis, 1879, p. 32.—*Pœcilia borealis ?* TACZAN., Bull. Soc. Zool. France, 1882, p. 392.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.	Exposed culmen.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*
92562	2599	Petropaulski, Kamtschatka	Sept. 19, 1883	♂	130	36	61	58	9
92568	2714	......do	Sept. 27, 1883	♂	133	28	66	59	9
92573	2743	......do	Oct. 2, 1883	♂	131	32	62	59	8
92576	2748	......do	Oct. 6, 1883	♂	130	29	65	58	8
92563	2600	......do	Sept. 19, 1883	♀	125	32	61	57	9
92564	2601	......do	Sept. 19, 1883	♀	128	32	61	57	9
92565	2604	......do	Sept. 20, 1883	♀	120	29	57	54	9
92566	2605	......do	Sept. 20, 1883	♀	127	33	62	57	9
92567	2606	......do	Sept. 20, 1883	♀	125	31	62	55	8
92569	2720	......do	Sept. 29, 1883	♀	132	33	62	57	8
92570	2724	......do	Sept. 30, 1883	♀	126	28	63	56	9
92574	2744	......do	Oct. 2, 1883	♀	......	......	62	57	9
92583	2758	......do	Oct. 9, 1883	♀	121	26	60	54	9
92584	2761	......do	Oct. 10, 1883	♀	......	......	62	54	8
92571	2725	......do	Sept. 20, 1883	......	128	33	63	56	9
92572	2742	......do	Oct. 2, 1883	......	132	33	63	59	9
92575	2745	......do	Oct. 2, 1883	....	......	......	61	58	9
92577	2749	......do	Oct. 7, 1883	......	131	33	62	59	8
92578	2750	......do	Oct. 7, 1883	....	135	34	......	......	......
92579	2751	......do	Oct. 7, 1883	......	......	......	61	55	9
92580	2752	......do	Oct. 7, 1883	......	......	......	62	56	9
92581	2753	......do	Oct. 7, 1883	......	......	......	63	59	8
92582	2756	......do	Oct. 7, 1883	......	......	......	65	62	10

Family SYLVIDÆ.

133. Acrocephalus ochotensis (MIDD.).

1853.—*Sylvia* (*Locustella*) *ochotensis* MIDDENDORF, Sibir. Reise, II, 2 (p. 185).—*Calamodyta o.* TACZAN., Bull. Soc. Zool. France, 1882, p. 387.—DYBOWSKI, Bull. Soc. Zool. France, 1883, p. 358.

1858.—*Sylvia certhiola* KITTLITZ, Denkw., II, p. 199 (*nec* PALL.).

1874.—*Locustella subcerthiola* SWINHOE, Ibis, 1874, p. 154.—DAVID. et OUST., Ois. Chine (p. 249) (1877).

1883.—*Acrocephalus dybowskii* STEJNEGER, Pr. U. S. Nat. Mus., VI, 1883, p. 92.—*Id.*, Naturen, 1882, p. 181.

The additional material I collected since submitting my preliminary report gives little need for further comment. All the additional specimens were taken during early summer. The female (No. 92559) is the palest one, with a decided cinereous tinge on the nape, corresponding closely with the male described by Mr. Taczanowski (*l. c.*).

With the same author I agree in his opposition to including this species in the genus *Locustella*.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*
89151	1251	Petropaulski	July 5, 1882	♂ ad.	149	......	70	57
92559	2184	Bering Island	June 21, 1883	♀ ad.	152	34	57	52
92560	2329	......do	June 28, 1883	(♂) ad	......	......	70	56
92558	2331	......do	July 13, 1883	(♂) ad.	......	......	69	56
92561	2307	Petropaulski	July —, 1883	ad.	......	......	70	56

No. 89151.—The type of *Acrocephalus dybowskii* STEJNEGER. Iris hazel. Feet clear yellowish brown.

No. 92559.—Iris brown Bill horny, blackish brown; basal half of lower mandible light gray, towards base yellowish, as is also the angle of mouth. Feet clear grayish brown, on the inner side tinged with yellowish; toes below yellow. Eggs swollen.

Of this bird which was rather numerous in the vicinity of Petropaulski, I have already given an account in my "Contributions," &c., Pr. U. S. Nat. Mus., 1883, p. 92, which need not be repeated here.

On the 21st of June I obtained a female on Bering Island. It was shot among the high grass near the beach, between Severnaja Seal-rookery and Saranna, and was in company with two others of its kind. Two others were shot and prepared on Bering Island, when I was absent on a trip to Copper Island. They were both said to be males. It is only an occasional visitor to the island.

134. Locustella hendersonii (CASS.).

1858.—*Sylvia locustella* KITTL., Denkw., II, p. 198 (*nec* LATH.).

1858.—*Lusciniopsis hendersonii* CASSIN, Proc. Phila. Acad., 1858, p. 194.—*Locustella hendersonii* SWINH., Ibis, 1863, p. 444.

1863.—? *Locustella minuta* SWINH., P. Z. S., 1863, p. 93.

1875.—*Locustella lanceolata* SWINH., Ibis, 1875, p. 449.—SEEBOHM, Ibis, 1879, p. 36.—BLAKIST. & PRYER, Trans. As. Soc. Japan, VIII, 1880, p. 222.—*Iid.*, *ibid.*, X, 1882, p. 158.—STEJNEGER, Naturen, 1882, p. 183.—TACZAN., Bull. Soc. Zool. France, 1882, p. 388.—DYBOWSKI, Bull. Soc. Zool. France, 1883, p. 358.—BLAKIST., Amend. List B. Jap., p. 22 (1884).

Seebohm (Brit. Mus. Cat., V, p. 119) describes the under wing-coverts and the axillaries as "pale chestnut." In my bird there is not a trace of such a color; in fact these feathers are of a pale buffish white. They agree much better with Cassin's description, where they are stated to have "a tinge of a very pale reddish." I have examined Cassin's type in the collection of the Philadelphia Academy, and found it to agree perfectly with my birds, which I consider sufficiently distinct from their western representative.

It was, as I thought, under rather peculiar circumstances that I made the first acquaintance of the Grasshopper-warbler. From what I had read about the habits of allied species, and conjectured from the manners of *Acrocephalus ochotensis*, I listened for this bird about and after sunset, wherever willows were abundant, in the marshy valley bottoms. I recollected the many poetical accounts of ornithological enthusiasts waiting in the wet swamps for the moon's rising over the white vapors, when the males of *Locustella nævia* would commence their strange chirping, and, invisible to the bewitched naturalist, mock round him like mischievous elves, now pitching their ventriloquous notes to the left, now to the right, until the gunning poet in bewilderment and despair sends a shot at random in the direction from whence the creaking thrills seem to proceed. So I tried patiently to get enchanted, bewildered, water-soaked, and mosquito-bitten too; but no *Locustella!*

It was a very hot day in the summer of 1882, in fact, the last day of June, that I took an ornithological morning ramble to a broad valley just behind the rounded hills, upon the sloping base of which Petropaulski is situated. The weather had been dry and warm for a considerable time; the vegetation was longing for rain, and the soil was gray and dusty. At last I determined to return, when the tropical rays of the sun at noon had silenced all birds, and the only living being in the neighborhood not seeking the cool shade was the mosquito-phobeous naturalist. Suddenly I was struck by the vigorous and rather protracted chirp of a heat-despising cricket. Something in its note led me to wish to get hold of the producer, so I cautiously proceeded in the direction of the sound. Zirrrrr......! But who describes my astonishment when I found that the supposed cicada was a small bird facing the sun from the top of a broken and dead birch! As he did not mind the noise I made, when breaking my way through the five-feet-high grass, if I only took care to stop whenever he interrupted his curious love-song, his fate was soon sealed. It is needless to say that I now became an attentive listener to the grating sound of the locusts, and half an hour later I was rewarded by another male, which I shot from the outer branches of a leaf-clad *Betula ermani.*

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*
89159	1240	Petropauloki	June 30, 1882	♂ ad.	125	56	......
89160	1241	......do	June 30, 1882	♂ ad.	120	58	46

No. 89159.—Iris dark hazel. Bill blackish brown; lower mandible brownish flesh-color. Feet flesh-color; toes above brownish; below yellowish.

No. 89160.—Iris, bill, and feet as foregoing.

135. Phyllopseustes borealis (Blas.).

1826.—*Motacilla trochilus* Pall., Zoogr. Ross. Asiat., I, p. 494 (*part*, *nec* Lin.).

1853.—*Sylvia* (*Phyllopneuste*) *eversmanni* Midd., Sibir. Reise, I, 2, (p. 178, tb. xvi, fig. 1-3) (*nec* Bonap.).—Radde, Reisen Süden Ost-Sibir., II (p. 263) (1863).—Dybow. & Parvex, J. f. Orn., 1868, p. 334.—Nelson, Cruise Corwin, p. 60 (1883).

1858.—*Phyllopneuste borealis* Blasius, Naumannia, 1858, p. 313.—*Id.*, Ibis, 1862, p. 68.—Swinhoe, P. Z. S., 1871, p. 356.—Tristram, Ibis, 1871, p. 231.—Taczan., J. f. Orn., 1872, p. 358.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, 1875, p. 245.—*Id.*, Bull. Soc. Zool. France, 1876, p. 141.—*Id.*, *ibid.*, 1882, p. 388.—*Id.*, Orn. Fauna Vost. Sibir., p. 26 (1877).—Baird, Brew. & Ridgw., B. N. Amer., I, p. 70 (1874).—David & Oustal., Ois. Chine (p. 271) (1877).—Stejneger, Naturen, 1882, p. 182.—*Id.*, Pr. U. S. Nat. Mus., 1883, p. 71.—*Phylloscopus b.* Seeb., Ibis, 1879, pp. 9 and 36.—Blakist. & Pryer, Trans. As. Soc. Japan, VIII, 1880, p. 223.—*Iid.*, *ibid.*, X, 1882, p. 159.—Nelson, Cruise Corwin, p. 60 (1883).—Blakist., Amend. List B. Jap., p. 56 (1884).—*Sylvia b.* Palmén, Cat. Fish. Exp., Lond. Swed., p. 204.

1858.—*Sylvia chloris* Kittlitz, Denkw., I, p. 314, and II, p. 200.

1860.—*Phylloscopus sylvicultrix* Swinh., Ibis, 1860, p. 53.—*Id.*, *ibid.*, 1866, p. 295.—*Phyllopneuste s.*, *Id.*, *ibid.*, 1863, p. 307.—*Id.*, P. Z. S., 1863, p. 295.

1869.—*Phyllopneuste kennicotti* Baird, Trans. Chic. Acad., 1869, I, 2 (p. 313), pl. xxx, fig. 2.

1872.—*Phyllopneuste magnirostris* Finsch, Abh. Nat. Ver. Bremen, III, p. 32 (*nec* Blyth).

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Exposed portion of first primary.	Tail-feathers.	Exposed culmen.	Tarsus.
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
88993	1184	Bering Island	June 9, 1882	♂ ad.	124	......	67	10	49	10	20
89157	1252	Petropaulski	July 6, 1882	♂ ad.	127	......	69	8	49	10	21
89158	1245	......do................	July 4, 1882	♂ ad.	134	......	72	13	54	10	20
89133	1215	Copper Island	June 20, 1882	♂ ad.	130	......	69	11	48	10	21
92551	2141	Bering Island	June 8, 1883	♂ ad.	129	24	64	10	48	10	21
92552	2148	......do................	June 9, 1883	♂ ad.	134	34	68	10	48	10	21
92553	2173	......do................	June 15, 1883	♂ ad.	139	25	72	9	51	11	21
92550	2174	.....do................	June 15, 1883	♂ ad.	140	24	72	11	50	10	20
92554	2179	.....do................	June 17, 1883	♂ ad.	131	25	66	10	47	10	20
92555	2182	.... do................	June 19, 1883	♂ ad.	133	23	70	11	49	10	20
92556	2639	Petropaulski	Sept. 25, 1883	♂	132	21	67	11	49	9	20
Average measurements of eleven males					132	25	69	10	49	10	20

No. 88993.—Iris dark brown. Bill horny brown, tomia and base of lower mandible yellowish; angle of mouth chrome yellow. Feet dark grayish brown, toes below yellow.

No. 92551.—Testes large, swollen.

No. 92553.—Feet clear yellowish brown.

No. 92556.—Iris dark brown. Bill above horny brown, below and at base orange-yellow. Feet brownish gray, tarsus behind and toes below yellow.

The above specimens have been carefully compared with a series from Alaska and another from China. But as both are too imperfectly labeled by the collectors, nothing definite can be said. Both series show inferior dimensions, which may be ascribed to the occurrence of females, while the Kamtschatkan series unfortunately only includes males. But it would seem as if the Alaskan birds have a comparatively smaller bill and smaller size altogether, and I should not be surprised if a larger and better determined series of specimens from Alaska would prove them entitled to rank as a subspecies under the name of *Ph. borealis kennicotti* (BAIRD). The case is absolutely parallel to that of *Budytes flavus leucostriatus*, offering the same suggestions as to the migratory route of the Alaskan birds.

Tables of dimensions.

A.—SPECIMENS FROM ALASKA.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Wing.	Exposed portion of first primary.	Tail-feathers.	Exposed culmen.	Tarsus.
						mm.	*mm.*	*mm.*	*mm.*	*mm.*
45909*	Pease	178	Saint Michael's, Alaska.	Aug. 16, 1866	......	60	9	43	9	20
75416	Nelson	438	....do	Aug. 24, 1877	......	60	7	42	9	20
75415	....do	462	... do	Aug. 31, 1877	♂ ..	65	9	46	8	20
Average measurements of three adults						62	8	44	9	20
75417	Nelson	463	Saint Michael's, Alaska.	Aug. 31, 1877	juv.	59	10	41	8.5	18

B.—SPECIMENS FROM CHINA.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Wing.	Exposed portion of first primary.	Tail-feathers.	Exposed culmen.	Tarsus.
86088	Jouy & Dale.	147	Hong-Kong	Sept. 25, 1881	......	64	11	47	11	20
86092	....do	152	Kowloon, China	Sept. 28, 1881	♀ ad.	63	10	41	9.5	20
86110	... do	173	Hong-Kong	Oct. 9, 1881	......	64	11	45	10	20
88504	Swinhoe	(†)	Amoy, China	....	......	66	7	46	11	19
88505	.. do	......	...do	May —, 1866	......	18	9	46	9.5	20
Average measurements of five specimens						65	10	45	10	20

* Type of *Ph. kennicotti* BAIRD.

† Labeled *Phyllopneuste sylvicultrix.*

The Arctic Willow-warbler is one of the commonest summer birds in the neighboring birch and elder groves of Petropaulski.

They are not known to breed on the islands, where they have been collected only during the spring migration. In 1882 I shot only one specimen on each island, but during the "bird-wave" of 1883, they were plentiful in the northern part of Bering Island.

The birds occurring on the islands belong to the same stock as those inhabiting the mainland of Kamtschatka. As already mentioned, the individuals from Alaska seem to travel on a route not touching Kamtschatka.

136. Phyllopseustes xanthodryas (SWINH.).

1863.—*Phylloscopus xanthodryas* SWINHOE, P. Z. S., 1863, p. 296.—SEEBOHM, Ibis, 1877, p. 71.—BLAKIST. & PRYER, Trans. As. Soc. Japan, VIII, 1880, p. 223.—*Iid.*, *ibid.*, X, 1882, p. 159.—JOUY, Pr. U. S. Nat. Mus., 1883, p. 283.—BLAKIST., Amend. List B. Jap., p. 16 (1884).—*Phyllopneuste x.* SWINH., P. Z. S., 1871, p. 356.—DAVID & OUST., Ois. Chine (p. 268) (1871).

This species is said to be distinguished from *Ph. borealis* in having the underparts more yellowish, a larger size, and a longer first primary. The latter two distinctions are formulated by Seebohm (Cat. Brit. Mus., V, p. 38) thus: "Exposed portion of bastard primary 0.3 to 0.35 inch [7.6 to 8.9^{mm}] in adults; 0.4 to 0.45 [10 to 11.4^{mm}] in birds of the year" in *borealis*, against "0.5 to 0.6 inch" [12.7 to 15.2^{mm}] in *xanthodryas*, and "length of wing 2.7 to 2.4 inches" [69 to 61^{mm}] in *borealis*, against "2.85 to 2.6 inches" [72 to 66^{mm}] in *xanthodryas*.

Comparing these measurements with those of *borealis* given by me in the table under the head of the latter species, it is evident that the individual variation, even in the same sex, is as great as the difference between the maximum of the larger and the minimum of the smaller species, as given by Seebohm. It will furthermore be seen that the average measurements of the first primary in my series is equivalent to the minimum length of the corresponding feather of the young bird, as stated by Seebohm, and that only one or two, out of eleven, have a bastard primary as small as the maximum given by the latter author. It is therefore evident that, for instance, No. 89158, in regard to the dimensions, should rank as *Ph. xanthodryas*. It agrees, however, so closely with the others of the same series in color that there can be no thought of separating it from these.

Below are given the dimensions of two genuine *Ph. xanthodryas* collected by Mr. Jouy in Japan, one a bird in summer plumage, the other one shot in the autumn. They are both males, as are all my specimens of *borealis*. A comparison of their dimensions gives the same results as above; they differ in no way, the largest of the two being even a trifle smaller than the largest *borealis*. The first primary is, however, in both, longer than the average of *borealis*, although in the smaller specimen it is a little shorter than the longest first primary in *borealis*. But the color is decidedly much more yellowish than in the eleven specimens belonging to the latter species.

It may here be well to remark that not only are the two Japanese specimens completely uniform in color *inter se*, but there is not the slightest difference between the specimen No. 92556 of *borealis* in autumnal plumage and the other ten obtained during the spring and summer months.*

Finally it may be stated that there is no difference in color whatever between the two Japanese specimens and No. 92557[*] shot at Petropaulski on the last day of September, 1883, the dimensions of which are given below. It is superior in size to the smaller of the Japanese birds, while its color is of exactly the same yellowish shade, and the length of the first primary is considerably [2.6^{mm}] greater than the maximum length of the same portion of the quill in the young *borealis.*

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* That the relative length of the second and sixth primaries is of little value is evident from the fact that in No. 75416 from Alaska the sixth is longer than the second.

My reasons for referring this single specimen to the Japanese species may be clearly seen from the above statements without further comment. But the question presents itself whether there is no intergradation between the two forms. The dimensions certainly intergrade, but not having seen or heard of intermediately colored forms I abstain from naming the present bird *Ph. borealis xanthodryas.*

Dimensions of the specimen collected.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Age.	Total length.	Tail beyond wings.	Wing.	Exposed portion of first primary.	Tail-feathers.
						mm.	*mm.*	*mm.*	*mm.*	*mm.*
92557	Stejneger.	2722	Petropaulski	Sept. 30, 1883	ad.	132	24	67	14	48

Table of dimensions of specimens from Japan.

U. S. Nat. Mus. No.	Collector's name.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Exposed portion of first primary.	Tail-feathers.
						mm.	*mm.*	*mm.*	*mm.*	*mm.*
88624	Jouy	573	Fuji, Japan	July 20, 1882	♂ ad.	......	......	71	15	52
91374	...do	682	Japan	Oct. 3, 1882	♂ ad.	......	......	65	12	47

Only one specimen was obtained in the neighborhood of Petropaulski, the species thus presumably being scarce. It was the last Willow-warbler I saw during the autumn of 1883.

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[*] The yellow color of these birds is of a very different tint from that of the young *borealis*, being of a clear yellow, suffused with greenish, while in the latter the yellow is duller and tinged with buff. It may perhaps not be unnecessary to state that No. 92557 is not a bird of the year,

Family TURDIDÆ.

137. Turdus eunomus TEMM.

1826.—*Turdus fuscatus* PALL., Zoogr. Ross. As., I, p. 451, tab. xii (*nec* VIEILL., 1807).—MIDD., Sibir. Reise Zool., I, 2 (p. 172) (1853).—SCHRENCK, Reise Amurl., I, p. 354 (1860).—SWINH., P. Z. S., 1862 (p. 317).—*Id.*, *ibid.*, 1863, p. 280.—*Id.*, *ibid.*, 1871, p. 366.—*Id.*, Ibis, 1863, I, pp. 93, 277.—*Id.*, *ibid.*, 1874, p. 157.—BLAKIST., Ibis, 1862, p. 319.—*Id.*, Amend. List B. Jap., p. 17 (1884).—BLAKIST. & PRYER, Ibis, 1878, p. 241.—*Iid.*, Trans. As. Soc. Japan, VIII, 1880, p. 227.—*Iid.*, *ibid.*, 1882, p. 167.—RADDE, Reisen Süd. Ost-Sibir. (p. 236) (1863).—PRZEWALSKI, Putesch. Ussur. Suppl. (n. 96) (1870).—FINSCH, Verh. Zool. Botan. Ges. Wien, 1872, p. 257.—TACZANOWSKI, J. f. Orn., 1872, p. 457.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, *ibid.*, 1875, p. 246.—*Id.*, *ibid.*, 1876, p. 193.—*Id.*, Bull. Soc. Zool. France, 1876 (p. 147).—*Id.*, *ibid.*, 1882, p. 388.—*Id.*, Orn. Fauna Vost. Sibir., p. 31 (1877).—HEUGLIN, J. f. Orn., 1874, p. 397.—BOLAU, J. f. Orn., 1880, p. 121.—*Id.*, *ibid.*, 1881, p. 56.—*Id.*, *ibid.*, 1882, p. 334.—JOUY, Pr. U. S. Nat. Mus., 1883, p. 279.

1831.—*Turdus eunomus* TEMM., Pl. Color., II, 87 livr., pl. 514.—DYBOWSKI & PARVEX, J. f. Orn., 1868, p. 333.

1877.—*Turdus dubius* DRESSER, Birds of Eur., (pt. lviii).—SEEBOHM, Ibis, 1879, p. 3.

A single specimen of this handsome Thrush was obtained on Bering Island between the sand-dunes opposite the village on the 3d of June, 1883. It is only a rare straggler from Kamtschatka.

At Petropaulski I met a small flock of this species May 15, 1883, and shot, but only wounded, one.

Specimen collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.
					mm.	*mm.*	*mm.*	*mm.*
92507*	2119	Bering Island	June 3, 1883	♀ ad.	244	50	123	86

*Iris dark brown. Bill horny black, except the basal three-fourths of upper tomium and lower mandible, except tip, pale orange. Feet pale grayish brown. Very fat. Stomach contained remains of *Staphylinidæ*.

138. Turdus obscurus GMEL.

1788.—*Turdus obscurus* GMEL., Syst. Nat., I, 2, p. 816.—MIDD., Sibir. Reise, I, 2 (p. 169) (1853).—RADDE, Reis. Süd. Ost-Sib. (p. 235) (1863).—DYB. & PARV., J. f. Orn., 1868, p. 333.—SWINH., P. Z. S., 1871, p. 367.—*Id.*, Ibis, 1874, p. 443.—TACZAN., J. f. Orn., 1872, p. 440.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, *ibid.*, 1875, p. 246.—*Id.*, *ibid.*, 1876, p. 193.—*Id.*, *ibid.*, 1881, p. 182.—*Id.*, Bull. Soc. Zool. Fr. 1876, p. 148.—*Id.*, *ibid.*, 1882, p. 388.—*Id.*, Orn. Fauna Vost. Sibir., p. 32 (1877).—DAV. & OUST., Ois. Chine (p. 153) (1877).—SEEB., Ibis, 1879, p. 4.—BLAK. & PRYER, Tr. As. Soc. Jap., VIII, 1880, p. 227.—*Iid.*, *ibid.*, X, 1882, p. 165.—JOUY, Pr. U. S. Nat. Mus., 1883, p. 277 (*part*).—BLAK., Amend. List B. Jap., p. 59 (1884).

1826.—*Turdus pallens* PALL., Zoogr. R. As., I, p. 457.—TEMM. & SCHL., F. Jap., Av. (p. 63, pl. xxvii) (1847).—KITTL., Denkw., II, p. 234 (1858).—SWINH., Ibis, 1860, p. 56.

As a whole, my specimens are considerably paler than a series of birds from Japan, collected by Mr. Jouy. Since the latter are autumnal specimens in fresh plumage, the difference may only be seasonal, however.

The coloration is very much the same in all the specimens, except in No. 92511, which is much brighter and deeper tinged, both above and underneath, than any of the others.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.
					mm.	mm.	mm.	mm.
92511	2149	Bering Island	June 10, 1883	♂ ad.	215	41	121	81
92513	2159	do	June 11, 1883	♂ ad.	228	40	125	86
92509	2170	do	June 13, 1883	♀ ad.	226	38	119	79
92508	2175	do	June 13, 1883	♀ ad.	227	40	120	82
92510	2176	do	June 15, 1883	♀ ad.	221	33	124	78
92512	2181	do	June 17, 1883	♀ ad.	228	32	126	83

No. 92513.—Iris dark brown. Bill horny blackish brown; lower mandible, except tip, which is dusky, tomia, and angle of mouth pale orange-yellow. Naked eye-ring and lower eyelash light yellowish gray. Feet, including claws, clear yellowish gray.

Nos. 92508, 92509, 92510.—Very fat. Eggs small, undeveloped.

No. 92512.—Feet more yellow than any of the foregoing.

A few individuals of this Thrush usually visit Bering Island in the spring, without any regularity, however. In 1883 the first was observed on one of the first days of June, and during the week between the 10th and the 17th of the same month, two males and four females were secured. They were extremely shy, and always single.

139. Ianthia* cyanura (PALL.).

1776.—*Motacilla cyanurus* PALL., Reisen Russ. Reichs, II (app., p. 709).—*Id.*, Zoogr. Ross. As., I, p. 490 (1826).—*Lusciola c.* TEMM. & SCHLEG., Fn., Jap. Av. (p. 54, pl. 21) (1847).—*L.* (*Nemura*) *c.* SCHRENCK, Reise Amurl., II, p. 361 (1860).—*Sylvia* (*Nemura*) *c.* MIDD., Sibir. Reise, II, 2 (p. 177, tb. 15, f. 5) (1853).—RADDE, Reis. Süd. Ost-Sibir., II (p. 258) (1863).—*Nemura c.* BLAKIST., Ibis, 1862, p. 318.—DYBOW. & PARVEX, J. f. Orn., 1868, p. 334.—PRZEW., Putesch. Ussur. (n. 53) (1870).—TACZAN., J. f. Orn., 1872, p. 364.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, *ibid.*, 1875, p. 246.—*Id.*, *ibid.*, 1876, p. 193.—*Id.*, Orn. Fauna Vost. Sibir., p. 27 (1877).—BOLAU, J. f. Orn., 1880, p. 117.—*Id.*, *ibid.*, 1881, p. 55.—STEJNEGER, Naturen, 1882, p. 180.—*Ianthia c.* SWINH., Ibis, 1863, pp. 91, 298.—*Id.*, P. Z. S., 1863, p. 290.—*Id.*, *ibid.*, 1871, p. 359.—WHITELY, Ibis, 1867, p. 197.—DAVID & OUST., Ois. Chine (p. 231, pl. 28) (1877).—BLAKIST. & PRYER, Ibis, 1878, p. 239.—*Iid.*, *ibid.*, Trans. As. Soc. Japan, VIII, 1880, p. 224.—*I.* (*Nemura*) *c.* *Iid.*, *ibid.*, X, 1882, p. 161.—*Tarsiger c.* JOUY, Pr. U. S. Nat. Mus., 1883, p. 281.—BLAKIST., Amend. List B. Jap., p. 58 (1884).

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* *Nemura*, *Nemoura*, and *Nematura* are all preoccupied in zoology and are therefore inapplicable. The propriety of uniting the type of *Ianthia* and its nearest allies with the forms comprising the genus *Tarsiger* seems rather doubtful to me.

1869.—*Nemura rufilata* Swinh., Ibis, 1860, p. 54 (*nec* Hodgs.).—*Ianthia r. Id.*, *ibid.*, 1861, p. 1861, p. 329.—*Id.*, *ibid.*, 1862, pp. 261, 264.—*Id.*, P. Z. S., 1862, p. 316.

One of the rarest stragglers which the "bird-wave" forced over to the inhospitable shores of Bering Island was a specimen of this delicately-built and exquisitely-colored species. It was secured during my absence in Petropaulski and prepared by my faithful native assistant, Nikanor, or "the professor," as he was usually styled. The determination of the sex (by dissection) and the measurement of the total length were also made by him.

Even in Kamtschatka the Bluestart is a rare bird, and I believe that this is the first record of it having been taken there. One hot day in July, 1882, when seeking the shades of the birches on the hillock opposite Petropaulski, I met a splendid male of this lovely bird, the only one I have ever seen alive. I had just laid down for a moment's rest in the dense grove when he perched on a branch right over my head, wagging his sky-blue tail rapidly up and down. I did not dare wait until I could get a longer shot, for if he took to the wing he would have been gone forever. So, feverish with excitement, I lifted my gun, but aimed nevertheless too well. When at last I found the mutilated body, literally without head and tail, I could have cried at my misfortune but for the hope that another might soon get within range of my cane-gun. But the other did not come, and the chirping titlarks found me on several succeeding days posted in vain at the same spot. The remains, however, were sufficient for identification.

Dimensions of specimen collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Sex and age.	Total length.	Wing.	Tail-feathers.
					mm.	mm.	mm.
92518	2070	Bering Island..................................	May 21, 1883	(♂) ad.	(123)	72	59

140. Melodes calliope (Pall.).

1776.—*Motacilla calliope* Pall., Reise Russ. Reich., III (p. 697).—*Lusciola c.* Temm. & Schleg., Faun. Jap. Aves (p. 57) (1847).—*Sylvia c.* Kittl., Denkw., I, p. 314, II, p. 199 (1858).—*Melodes c.* Blasius, List B. Eur., p. 10 (1862).—*Erithacus c.* Blakist., Amend. List B. Jap., p. 58 (1884).

1799.—*Turdus camtschatkensis* GMEL., Syst. Nat., I, 2, p. 817.—*Sylvia* (*Calliope*) *kamtschatkensis* MIDD., Sibir. Reise, II. 2 (p. 174) (1853).—*Lusciola* (*C.*) *k.* SCHRENCK, Reise Amurl., I, p. 359 (1860).—*Calliope camtschatkensis* SWINH., P. Z. S., 1871, p. 359.—TACZAN., J. f. Orn., 1872, p. 433.—*Id.*, *ibid.*, 1874, p. 335.—*Id.*, *ibid.*, 1876, p. 193.—*Id.*, *ibid.*, 1881, p. 181.—*Id.*, Orn. Fauna Vost. Sibir., p. 27 (1877).—*Id.*, Bull. Soc. Zool. France, 1876, p. 143.—*Id.*, *ibid.*, 1880, p. 136.—*Id.*, *ibid.*, 1882, p. 338.—DAVID & OUST., Ois. Chine (p. 235) (1877).—BLAKIST. & PRYER, Ibis, 1878, p. 239.—*Iid.*, Trans. As. Soc. Jap., VIII, 1880, p. 225.—*Iid.*, *ibid.*, X, 1882, p. 161.—STEJNEGER, Naturen, 1882, p. 181.—*Id.*, *ibid.*, 1884, p. 6.

Kamtschatka's Nightingale, one of the loveliest birds I ever saw or heard, breeds plentifully round Petropaulski, especially in the sunny alder-groves on the slopes above and behind the town. In the late spring of 1883 I shot the first male arrivals on the 22d of May. It was absolutely silent, creeping shyly among the lower branches of the bushes. During the following autumn I met several in the latter part of September. They were found especially in a narrow valley on the eastern side of the graveyard, the same place where Kittlitz, more than fifty years ago, had collected his specimens during the same season of the year. About the 1st of October all had left.

A single straggler was shot on Bering Island January 29, 1883. It has the throat and chin white, with some mottlings of the lovely scarlet, which adorns these parts in the adult male. On the island it is only an accidental visitor.

List of specimens collected.

U. S. Nat. Mus. No.	Collector's No.	Locality.	When collected.	Age and sex.	Total length.	Tail beyond wings.	Wing.	Tail-feathers.
					mm.	mm.	mm.	mm.
89155	1232	Petropaulski	June 27, 1882	♂ ad.	167	......	79	63
89156	1236	......do	June 29, 1882	♂ ad.	175	......	79	64
92514	2050	......do	May 22, 1883	♂ ad.	172	45	......	......
92517	2330	Bering Island	June 29, 1883	♂ ! ad.	......	......	76	57
92515	2306	Petropaulski	July —, 1883	ad.	......	......	77	65
92516	2593	......do	Sept. 18, 1883	♂	170	38	78	63
	2642	......do	Sept. 25, 1883	♂	164	34	......	......

No. 89155.—Iris dark brown. Bill brownish black. Feet grayish brown, hind part of tarsus shining whitish.

No. 89156.—As foregoing. Inside of mouth blackish brown.

No. 92514.—Iris dark brown. Bill horny grayish black. Feet dark pearl gray, below lighter with a livid tinge. Inside of mouth blackish. Testes large, swollen, dark olive gray.

No. 92516.—Bill horny blackish brown, paler at base of lower mandible; angle of mouth pale yellow; interior of mouth pale orange. Feet of a dark silvery gray with a brownish violet tinge, and tarsus white behind. Testes small, black.

No. 2642.—Bill horny blackish brown, pale flesh-color at base of lower mandible. Otherwise like *the foregoing.*

II.—SYNOPSIS OF THE BIRDS REPORTED TO INHABIT KAMTSCHATKA.

SYNOPSIS OF THE BIRDS REPORTED TO INHABIT KAMTSCHATKA.

The chief sources of our knowledge of the Kamtschatkan ornis are the explorations of Steller, Vossnessenski, v. Kittlitz, Dybowski, and myself, but the localities from which reliable information has been gathered are very few and limited, considering the area of the country, the greater part of which is still a *terra incognita.* We know next to nothing about the distribution of the species all along the western coast, and absolutely nothing about the birds on the eastern side north of Nischnij Kamtschatka. We know very little, if anything, about the relations of the two coasts of the peninsula *inter se;* we do not know much more about the birds of the mountains and their vertical distribution; and we are ignorant of the northern limits of most of the species.

The following list, therefore, only attempts to enumerate the species which have been recorded from Kamtschatka (including the Commander Islands) without going into details. The figures in parenthesis following the name refers to the page of this volume where the references belonging to the species will be found. The other species are provided with the necessary references.

A few names, more or less generally credited to Kamtschatka without there being any reliable authority for the statements, are given without a number.

COLYMBOIDEÆ.

1. **Colymbus holbœllii** (REINH.) (p. 11).
2. **Colymbus auritus** (LIN.) (p. 14).

ALCOIDEÆ.

3. **Urinator adamsii** (GRAY) (p. 14).

Whether *U. imber* also occurs is doubtful, but not improbable.

4. **Urinator arcticus** (LIN.).

Colymbus arcticus KITTL., Denkw., I, p. 330.—TACZAN., B. S. Z. F., 1882, p. 398.

5. **Urinator lumme** (Gunn.) (p. 15).

6. **Uria lomvia arra** (Pall.) (p. 17).

7. **Uria troile californica** (Bryant) (p. 20).

Cepphus mandtii (Licht.).

Schlegel (Mus. P. B. Urinat., p. 19) enumerates as No. 5 of *Alca grylle* an "Individu au plumage parfait, *et au miroir d'un blanc pur*; mais au ventre varié d'un petit nombre de plumes blanches, restes du plumage d'hiver, Kamtschatka, 1862." There can be no doubt that this specimen is referable to *mandtii*, which, consequently, sometimes comes as far down as Kamtschatka, provided the locality be correct.

8. **Cepphus columba** Pall. (p. 21).

9. **Cepphus carbo** Pall. (p. 21).

10. **Brachyramphus marmoratus** (Gm.).

Taczan., B. S. Z. F., 1883, p. 345.

11. **Brachyrampus kittlitzii** Brandt.

The original specimens came from Petropaulski (Brandt, Mel. Biol., VII, p. 215).

Taczanowski (*l. c.*) mentions two specimens of a *Brachyramphus* obtained in Kamtschatka by Dr. Dybowski as different from *marmoratus*, without determining the species. They probably belong here.

12. **Synthliboramphus antiquus** (Gm.) (p. 23).

Ptychoramphus aleuticus (Pall.).

According to Lichtenstein's "Nomenclator Avium Musei Berolinensis" (1854), p. 105, the collection of the Berlin Museum contains a single specimen from "Kamtschatka." The locality needs confirmation, however.

13. **Simorhynchus pygmæus** (Gm.) (p. 23).

14. **Simorhynchus cristatellus** (Pall.) (p. 32).

15. **Simorhynchus pusillus** (Pall.) (p. 35).

16. **Cerorhinca monocerata** (Pall.).

Chimerina cornuta Dybow., Orn. Centrbl., 1882, p. 28.

17. **Cyclorhynchus pstittaculus** (Pall.) (p. 38).

18. **Lunda cirrhata** Pall. (p. 43).

19. **Fratercula corniculata** (Naum.) (p. 59).

LAROIDEÆ.

20. **Larus glaucescens** Naum. (p. 62).

21. **Larus glaucus** Brünn.

Taczan., B. S. Z. F., 1883, p. 341.

22. **Larus schistisagus** Stejn. (p. 67).

This is, in all probability, the bird which Taczanowski has recorded as "Larus pelagicus Bruch," a name which belongs to *L. dominicanus* as a synonym. It is also probably the same which Schlegel records from Kamtschatka as *L. occidentalis*, and Finsch (Ibis, 1879, p. III), as *L. affinis*.

? **Larus borealis** BRANDT.

TACZAN., B. S. Z. F., 1882, p. 397.

"Des Oiseaux et des œufs de l'île Behring." Probably *L. glaucescens* is meant; or else it is *L. cachinnans* with an erroneous locality, for this latter species does not breed on Bering Island.

23. **Larus cachinnans** PALL.

At the entrance to Avatcha Bay I observed a number of these birds during the latter part of September, 1883.

24. **Larus kamtschatchensis** (BP.) (p. 73).

25. **Larus canus** LIN. (p. 76).

26. **Larus ridibundus** LIN. (p. 76).

Rhodostethia rosea (MACGILL.).

Two specimens in immature plumage are in the museum of Mayence, said to have come from Kamtschatka.

Mr. Howard Saunders gives a detailed account of them in the Ibis for 1875, pp. 484–487, but doubts the correctness of the statement as to the locality, as follows:

"The history of these specimens is not very satisfactory. They were purchased some years ago from the Maison Verreaux, and were stated to have come from Kamtschatka. When the late M. Jules Verreaux was staying with me, in 1870, I had a good deal of conversation with him about Laridæ and the Bürch collection, and I remember his expatiating upon the beauty, and especially the lovely rose-tint, of two specimens which he had sent to the Mayence Museum; he also persisted that they really did come from Kamtschatka, and that he had them from a Pole who had been there. It was impossible to contradict him; but for various reasons, upon which I need not enlarge, I was skeptical as to the locality, and continue to be so. It is true that another Arctic species (*Xema sabinii*) has been found breeding in both continents; but then its range can be traced from Greenland right across the American continent, and it is quite natural that it should pass into Siberia; whereas the Americans, with all their energy and research, have hitherto failed to acquire a single specimen of *Rhodostethia rosea*, either in their own Alaska possessions or in those portions of Kamtschatka visited by the United States Telegraph Surveying Expedition, which was accompanied by most able naturalists. In fact, what little we do know about this gull tends to show that its habitat is extremely restricted; but upon this point it is needless to say more, as our Arctic expedition will, we trust, give us some further account of it."

Now that we know that Nordenskjold's Vega expedition obtained a specimen on the northeastern coast of Siberia, and the Point Barrow party collected numerous specimens at that locality, the occurrence of stragglers of the species in question on the coast of Kamtschatka is not stranger than its accidental appearance in Yorkshire or in Heligoland.

27. **Rissa tridactyla pollicaris** STEJN. (p. 78).

28. **Rissa brevirostris** (BRUCH) (p. 82).

29. **Gavia alba** (GUNN.).

TACZAN., B. S. Z. F., p. 1883, 341.

30. **Sterna camtschatica** PALL. (p. 83).

31. **Sterna paradisæa** BRÜNN. (p. 85).

? ? **Sterna leucoptera** Schinz.

The statement of Pallas that this species (*St. fissipes*, Z. R. A., II, p. 338) "also occurs in Kamtschatka" is too vague to be accepted without confirmation.

32. **Stercorarius parasiticus** (Lin.) (p. 86).
33. **Stercorarius longicaudus** Vieill. (p. 87).

PROCELLAROIDEÆ.

34. **Diomedea albatrus** Pall. (p. 89).
35. ? **Diomedea nigripes** Audub.

Taczan., B. S. Z. F., 1882, p. 398.

This species is enumerated with a query, since there is a probability that the bird recorded from "les rivages du Kamtschatka" is nothing but a young *D. albatrus.*

36. **Fulmarus glacialis glupischa** Stejn. (p. 91).
37. **Puffinus tenuirostris** (Temm.) (p. 96).

? **Œstrelata desolata** (Gm.).

A specimen in the Leyden Museum is said by Bonaparte (Consp. Av., II, p. 189) and Schlegel (Mus. P. B. Procell., p. 13) to have come from Kamtschatka. Like similar statements it requires confirmation.

38. **Oceanodroma leucorhoa** (Vieill.) (p. 97).
39. **Oceanodroma furcata** (Gm.) (p. 98).

SCOLOPACOIDEÆ.

40. **Hæmatopus osculans** (Swinh.) (p. 100).
41. **Arenaria interpres** (Lin.) (p. 102).
42. **Charadrius squatarola** (Lin.) (p. 103).
43. **Charadrius dominicus fulvus** (Gm.) (p. 104).
44. **Ægialitis mongola** (Pall.) (p. 105).
45. **Gallinago gallinago** (Lin.) (p. 110).
46. **Gallinago hyemalis** (Ewersm.) ?

Taczan., B. S. Z. F., 1883, p. 340.

47. **Arquatella couesi** (Ridgw.) (p. 112).
48. **Actodromas acuminatus** (Horsf.) (p. 115).
49. **Actodromas damacensis** (Horsf.) (p. 116).
50. **Actodromas ruficollis** (Pall.) (p. 118).
51. **Actodromas temminckii** (Leisl.) (p. 119).
52. **Pelidna alpina pacifica** (Coues) (p. 120).

Tringa cinclus Midd., Isep. Russl., p. 125.

53. **Calidris arenaria** (Lin.) (p. 122).
54. **Limosa lapponica baueri** (Naum.) (p. 122).
55. **Limosa ægocephala melanuroides** (Gould).

Limosa melanura Kittl., Denkw., II, pp. 294, 314.—*L. melanuroides* Taczan., B. S. Z. F., 1883, p. 340.—Bogdan., C. A. I. R., I, p. 85.

56. **Pseudototanus guttifer** (Nordm.) (p. 124).

57. **Totanus nebularius** (Gunn.) (p. 128).

58. **Totanus ater** (Sander) (p. 129).

59. **Totanus glareola** (Lin.) (p. 130).

60. **Pavoncella pugnax** (Lin.).

Trynga pugnax Pallas, Z. R. A., II, p. 191:

"In Camtschatca raro apparent." Dybowski's hunter secured two specimens on Bering Island during the spring migration of 1883.

61. **Actitis hypoleucos** (Lin.) (p. 131).

62. **Terekia cinera** (Güld.) (p. 132).

63. **Heteractitis incanus** (Gm.) (p. 132).

64. **Heteractitis brevipes** (Vieill.) (p. 137).

65. **Numenius cyanopus** (Vieill.).

N. arguata Midd., Isep. Russl., p. 125.
N. australis Schrenck, R. Amurl., I, p. 433; Bogdan., C. A. I. R., I., p. 82.
N. tahitiensis Taczan., B. S. Z. F., 1832, p. 397, and 1883, p. 340.

66. **Numenius phæopus variegatus** (Scop.) (p. 138).

67. **Phalaropus lobatus** (Lin.) (p. 139).

68. **Crymophilus fulicarius** (Lin.) (p. 140).

It may be added here that Merck observed this species, "circa Camtschatcam," according to Pallas (Z. R. A., II, p. 205).

GRUOIDEÆ.

69. **Grus grus orientalis** (Blyth)?

Steller (Beschr. Kamtsch., p. 142) speaks of the crane, and "*Grus vulgaris*" is said by Pallas (Z. R. A., II, p. 106) to have been observed in Kamtschatka during the migrations. The natives of Bering Island also told me of a bird, according to their description evidently a Crane, which is occasionally seen at the island. The specific name as given above is merely conjectural, of course.

ANATOIDEÆ.

70. **Anser segetum middendorffi** (Severz.) (p. 141).

A. s. Midd., Isep. Russl., p. 126.

Taczanowski mentions two species of Geese of this group from Kamtschatka: "*A. grandis* Midd." and "*A. segetum* Lin." Probably both belong to the present species.

71. **Anser albifrons gambeli** (Hartl.) p. (145).

A. a. Midd., Isep. Russl., p. 126.

72. **Chen hyperboreus** (Pall.).

Anser h. Pallas, Z. R. A., II, p. 228:

"Rarissimi apparent in Camtschatca." During the early autumn of 1883 the native hunters on Bering Island observed what they called "Swans with black wings," probably individuals of this species.

73. **Branta canadensis hutchinsii** (RICH.) (p. 147).

"Anser pictus," KITTL., Denkw., II, p. 334, by the inhabitants called "Bjeloscheika" (=white-throat), is probably this species.

74. **Branta nigricans** (LAWR.) (p. 149).

75. **Cygnopsis cygnoides** (PALL.).

PALLAS, Z. R. A., II, p. 219.—TACZAN., B. S. Z. F., 1883, p. 343.

76. **Olor cygnus** (LIN.) (p. 149).

77. **Olor columbianus** (ORD) (p. 150).

78. **Anas boschas** (LIN.) (p. 152).

79. **Dafila acuta** (LIN.) (p. 153).

80. **Nettion crecca** (LIN.) (p. 155).

81. **Querquedula querquedula** (LIN.) (p. 156).

82. **Eunetta falcata** (GEORGI) (p. 156).

Anas f. MIDD., Isep. Russl., p. 126.

83. **Eunetta formosa** (GEORGI).

TACZAN., B. S. Z. F., 1883, p. 343.

84. **Mareca penelope** (LIN.) (p. 157).

85. **Mareca americana** (GM.) (p. 158).

86. **Spatula clypeata** (LIN.) (p. 159.)

87. **Aythya fuligula** (LIN.) (p. 160).

88. **Aythya marila** (LIN.) (p. 160).

?? **Aythya ferina** (LIN.).

During the spring of 1883 a Duck was described to me by a Bering Island hunter as being exactly like the "Tschernick" (*A. marila*), but with red instead of black head. He had seen a pair in Kamenuij Valley. They may have belonged to this species.

89. **Clangula clangula** (LIN.) (p. 163).

90. **Charitonetta albeola** (LIN.) (p. 166.)

91. **Histrionicus histrionicus** (LIN.) (p. 166).

92. **Harelda hyemalis** (LIN.) (p. 169).

93. **Eniconetta stelleri** (PALL.) (p. 170).

94. **Somateria v-nigra** GRAY (p. 173).

95. **Somateria spectabilis** (LIN.).

STELLER, Beschr. Kamtsch., p. 188.—PALLAS, Z. R. A., II, p. 237.—TACZAN., B. S. Z. F., 1883, p. 344.

96. **Oidemia americana** (SW. & RICH.) (p. 174).

97. **Oidemia deglandi** BP. (p. 174).

98. **Merganser merganser** (LIN.) (p. 176).

99. **Merganser serrator** (LIN.) (p. 178).

100. **Mergus albellus** LIN. (p. 178).

PHALACROCORACOIDEÆ.

101. **Phalacrocorax perspicillatus** PALL. (p. 180).

102. **Phalacrocorax urile** (GM.) (p. 181).

103. **Phalacrocorax pelagicus** PALL. (p. 187).

?? **Phalacrocorax carbo** PALLAS.

Z. R. A., II, p. 297: "Vulgares usque in Camtschatcam." Perhaps the Japanese form may occur on the western shore near the southern extremity of the peninsula.

TETRAONOIDEÆ.

104. **Urogallus parvirostris kamtschaticus** (KITTL.) (p. 192).

? ? **Falcipennis falcipennis** (HARTL.).

Occasionally "Kamtschatka" is given as the habitat of this species. It seems not to occur there, however, and the statement is probably due to some earlier author who ignorantly supposed that all the countries surrounding the Okotsk Sea belonged to Kamtschatka. It must be remarked, however, that also Bogdanow (Consp. Av. Imp. Ross., I, p. 30) (1884) gives Kamtschatka as the habitat of this bird.

? ? **Bonasa albigularis** BREHM.

Brehm, in Naumannia, 1855, p. 287, described it in the following words: "Bonasia albigularis, mento albo. Kamtschatkalis." In J. f. Orn., 1860, p. 393, is a statement that the specimen was originally brought from Kamtschatka by Tilesius. No one else has found the Hazel Grouse in Kamtschatka. The specimen may be from Siberia, though, and is possibly identical with Menzbier's *B. griseiventris*, in which case Brehm's name would have priority; even Pallas says, "in Camtschatca, Stellero observante, deest."

"Graue Rebhüner befinden sich allein um *Werchoi Ostrog*, doch sehr selten" (Steller, Beschr. Kamtsch., p. 193.) Gray Partridges! May they not, perhaps, be one of the two mentioned?

105. **Lagopus lagopus** (LIN.) (p. 194).

106. **Lagopus mutus** (MONTIN)?

TACZAN., B. S. Z. F., 1883, p. 338.—*L. alpinus* BOGDAN., C. A. I. R., I, p. 33.—DYB., B. S. Z. F., 1883, p. 368.

The Ptarmigan found in the mountains of the peninsula has not been satisfactorily determined. It would be no surprise if it should prove to be distinct. It is pretty safe to say, however, that it is not typical *mutus*.

107. **Lagopus ridgwayi** STEJN. (p. 194).

ACCIPITROIDEÆ.

108. **Falco rusticolus** LIN. (p. 203).

109. **Falco islandus** BRÜNN. (p. 204).

110. **Falco pealei** RIDGW. (p. 206).

111. **Falco peregrinus** TUNST.?

TACZAN., B. S. Z. F., 1883, p. 330.

The description of an adult male given by Taczanowski seems to indicate *F. pealei*. The exact identification cannot be made without examining the specimen, and *F. peregrinus* is therefore retained with a query.

112. **Falco subbuteo** LIN.

PALLAS, Z. R. A., I, p. 332.—*Hypotriorchis s.* TACZAN., B. S. Z. F., 1882, p. 384.—DYB., *ibid.*, p. 352.

113. **Astur candidissimus** DYBOW.

Accipiter astur PALLAS, Z. R. A., I, p. 370.—*Astur palumaribus*, "weissliche Varietät," KITTL., Denkw., II, p. 344.—*A. atricapillus* "albino complete," TACZAN., B. S. Z. F., 1883, p. 332.—*Astur candidissimus* DYBOW., *ibid.*, p. 353.

Steller is the first author to mention the White Hawk: "Eine besondere Sorte weisser Habichte" (Beschr. Kamtsch., p. 194).

? **Astur palumbarius** (LIN.).

Taczanowski (B. S. Z. F., 1883, p. 331), under the heading of *Astur atricapillus*, mentions having received a "young female from Bolszeiethk [Bolscheretschk ?], differing from a female from Quebec, in similar plumage, by having the general color much clearer," &c. The identification of this specimen is extremely doubtful; it is probably only a young of *A. candidissimus*.

114. Accipiter nisus (LIN.).

TACZAN., B. S. Z. F., 1883, p. 332.—DYB., *ibid.*, p. 355.

115. Archibuteo lagopus (BRÜNN.) (p. 208).

116. Aquila chrysaëtos (LIN.).

Aquila nobilis PALLAS, Z. R. A., I, p. 341.—*A. ch.* TACZAN., B. S. Z. F., 1883, p. 329.—DYB., *ibid.*, p. 351.

? **Aquila clanga** PALLAS (Z. R. A., I, p. 351; "usque in Camtschatcam") is probably the same bird which Steller mentions as "*Naevia*" (Beschr. Kamtsch., p. 193). But where refer it ?

117. Haliæetus leucocephalus (LIN.) (p. 209).

118. Haliæetus hypoleucus RIDGW. (p, 213).

119. Haliæetus albicilla (LIN.) (p. 216).

Aquila a. MIDD., Isep. Russl., p. 123.

120. Thalassoaetus pelagicus (PALL.) (p. 217).

Aquila p. MIDD., Isep. Russl., p. 123.

121. Pandion haliætus (LIN.) (p. 219).

Falco h. MIDD., Isep. Russl., p. 123.

STRIGOIDEÆ.

122. Asio otus (LIN.).

Otus vulgaris TACZAN., B. S. Z. F., 1882, p. 385.

123. Asio accipitrinus (PALL.) (p. 220).

Megascops scops (LIN.).

Scops kamtschatkensis BP., Rev. et Mag. de Zool., 1854 (p. 543).

Scops giu SCOPOLI.—SHARPE, Brit. Mus. Cat., II, p. 47 (1875).

"A French specimen collected by Mr. Swainson is in the Cambridge Museum, and nearly equals in intensity the type of *Scops kamtschatkensis* in the Paris Museum. I carefully compared this with ordinary European examples, and can affirm with certainty that it is nothing but a more than ordinarily rufous *Scops giu;* no authority for its Kamtschatkan habitat exists beyond the assertion of the late M. Jules Verreaux.

"In the Paris Museum there is another specimen marked as from Kamtschatka, and absolutely identical with ordinary European specimens." (SHARPE, *l. c.* pp., 50, 51.) The locality requires confirmation.

? **Ulula** sp.

Stryx barbata PALLAS, Z. R. A., I, p. 318.—"Stellero frequenter ad Lenam inque Camtschatca observata."

124. Nyctea nyctea (LIN.) (p. 221).

125. Surnia ulula (LIN.).

Strix nisoria KITTL., Denkw, II, p. 409.

S. u., DALL. & BANNIST., Tr. Chicago Acad., I, 1869, p. 274.—TACZAN., B. S. Z. F., 1883, p. 332.—DYBOW., B. S. Z. F., 1883, p. 355.

The latter says that "ils ont les raies blanches caudales distinctement plus larges et d'une nuance plus pure," and Dall mentions a specimen from Petropaulski as "remarkably light colored." The Kamtschatkan bird may be subspecifically separable.

CUCULOIDEÆ.

126. Cuculus canorus telephonus (HEINE). (p. 224.)

C. c. MIDD., Isep. Russl., p. 124.

127. Cuculus peninsulæ STEJN. (p. 227.)

PICOIDEÆ.

?? **Dryocopus martius** (LIN.).

Dryopicus martius DYBOW., B. S. Z. F., 1883, p. 368.

No specimens obtained; only determined from the voice.

128. Dryobates purus STEJN. (p. 230.)

129. Dryobates immaculatus STEJN. (p. 231.)

? **Dryobates** sp.

Picus cirris PALLAS, Z. R. A., I, p. 410:

"Per omnem Rossiam et Sibiriam, usque in Camtschatcam abundat." Not confirmed by later explorers. When considering the greater or lesser probability of the occurrence of a form of *Dryobates leucotus* in Kamtschatka, it must be borne in mind that this species is represented in Japan, as are likewise the two other species of the genus inhabiting the peninsula.

130. Picoides albidior STEJN.

Picus tridactylus KITTL., Denkw., 1, pp. 327, 329.

Picoides crissoleucus TACZAN., B. S. Z. F., 1882, p. 396.

MICROPODOIDEÆ.

131. Micropus pacificus Lath. ?

Cypselus—KITTL., Denkw. I, p. 338.

? "*Cypselus pacificus* LATH.," DYBOW., B. S. Z. F., 1883, p. 356.

The species is only mentioned by Dybowski with a query and no further details. Kittlitz describes it as "etwa von der Grösse des *C. melba*, doch von meist dunkler Farbe des Unterleibes."

PASSEROIDEÆ.

132. Alauda blakistoni STEJN. (p. 234.)

A. arvensis MIDD., Isep. Russl., p. 124.

133. Nucifraga caryocatactes (LIN.).

Corvus caryocatactes PALL., Z. R. A., I, p. 398.

N. c. KITTL., Denkw. I, p. 335.—TACZAN., B. S. Z. F., 1882, p. 392.

134. Corvus corax LIN.

Corvus corax PALL., Z. R. A., I, p. 380.—KITTL., Denkw., I, p. 313.

Corvus corax kamtschaticus DYBOW., B. S. Z. F., 1883, p. 362.

The difference of the present bird from the typical *corax* is not clearly stated by Dr. Dybowski.

135. **Corvus behringianus** (Dybow.). (p. 237.)

136. **Corvus corone levaillantii** (Less.). (p. 239.)

137. **Pica camtschatica** Stejn. (p. 241.)

?? **Corvus glandarius** Pallas.

Z. R. A., I, p. 394: "Dantur vero in Camtschatica australiore."

?? **Cyanocitta stelleri** (Gm.).

Cab., Mus. Hein., I, p. 221 (1851).

The only specimen in the Museum Heineanum is given as coming from "*Kamtschatka*" (p. 222), but the locality is in all probability erroneous, as in many other instances in the same collection.

138. **Hypocentor aureolus** (Pall.) (p. 244.)

Emberiza a. Midd., Isep. Russl., p. 124.

139 **Hypocentor rusticus** (Pall.) (p. 246.)

140. **Hypocentor variabilis** (Temm. & Schl.) p. (247.)

141. **Emberiza schœniclus** (Lin.).

Schœnicola arundinacea Taczan., B. S. Z. F., 1882, p. 392.—Dyb., *ibid.*, 1883, p. 364.

142. **Plectrophenax nivalis** (Lin.) (p. 248.)

143. **Calcarius lapponicus** (Lin.) (p. 250.)

144. **Acanthis linaria** (Lin.) (p. 252.)

145. **Acanthis linaria holbœllii** (Brehm.) (p. 256.)

146. **Acanthis hornemannii exilipes** (Coues) (p. 258.)

147. **Leucosticte brunneonucha** (Brandt).

Fringilla b. Midd., Isep. Russl., p. 124.

Kittl., Denkw., I, p. 336.—Taczan., B. S. Z. F., 1882, p. 393.—Dyb., *ibid.*, 1883, p. 364.

148. **Leucosticte griseonucha** (Brandt) (p. 261.)

149. **Fringilla montifringilla** (Lin.) (p. 264.)

150. **Chloris kawarahiba** (Temm. & Schl.) (p. 265.)

151. **Coccothraustes coccothraustes** (Lin.)?

Coccothraustes vulgaris Midd., Isep. Russl., p. 124.

According to Middendorff this species was observed or collected (?) by Vossnessenski at the Kamtschatka River (57° N. Lat.), March 18, 1848 (old style, = March 30, new style). Has not been observed since.

152. **Pyrrhula pyrrhula kamtschatica** (Taczan.).

Pyrrhula rubicilla Pall., Z. R. A., II, p. 8.—Kittl., Denkw., I, p. 322.—*P. k.* Taczan., B. S. Z. F., 1882, p. 395.—Dyb., *ibid.*, 1883, p. 367.

153. **Carpodacus erythrinus grebnitskii** Stejn. (p. 265.)

154. **Pinicola enucleator** (Lin.).

Cf. Bonap., Coll. Delattre, p. 20.

Loxia enucleator Kittl., Denkw., I, p. 335.

Corythus enucleator Taczan., B. S. Z. F., 1882, p. 394.

Corythus enucleator kamtschatkensis Dybow., B. S. Z. F., 1883, p. 367.

Bright specimens have already been separated by v. Homeyer as *P. flammula*, but they hardly constitute a race.

155. **Loxia** sp. ?

Loxia leucoptera DYBOW., B. S. Z. F., 1883, p. 367.
Loxia bifasciata DYB. & TACZ., B. S. Z. F., 1884, extr. p. 2.

"Une femelle ou un jeune" (!) from Bering Island (Dyb.). The determination of the species is entirely unreliable. The only information as to the occurrence of a Cross-bill in Kamtschatka is furnished by Pallas, who, under *Loxia crucirostra* (Z. R. A., II, p. 4), says: "In Camtschatca cum sylva deest hyeme tota gregaria apparet, voce et cantu rariore."

156. **Clivicola riparia** (LIN.) (p. 267.)

Hirundo r. MIDD., Isep. Russl., p. 125.

157. **Chelidon tytleri** (JERDON) (p. 269.)

Hirundo rustica (*rufa*) MIDD., Isep. Russl., p. 125.

158. **Chelidon kamtschatica** (DYBOW.).

Hirundo k. DYBOW., B. S. Z. F., 1883, p. 356.
Hirundo borealis DYB. & TACZ., B. S. Z. F., 1884, extr. p. 7.

We have seen the type of this species, and are inclined to regard it as valid.

?? **Hirundo lagopoda** PALL.

"Ad Camtschatcam usque," says Pallas (Z. R. A., I, p. 533). Nothing definite is known, however, and the statement is very doubtful, though it may be remembered that it is said to occur at Gischiginsk.

159. **Ampelis garrulus** LIN.

Bombycilla garrula KITTL., Denkw., I, p. 338.—TACZAN., B. S. Z. F., 1882, p. 392.—DYB., *ibid.*, 1883, p. 368.

"La nuance des parties supérieures du corps est un peu plus claire que dans les Oiseaux d'Europe." Taczan., l. c.

160. **Lanius cristatus** (LIN. ?).

Lanius phoenicurus KITTL., Denkw., II, p. 313.—*Otomela ph.* DYB. & TACZ., B. S. Z. F., 1884, extr. pp. 2, 11.
Otomela superciliosa DYBOW., B. S. Z. F., 1883, p. 362.

161. **Lanius sibiricus** (BOGDAN.).

Lanius major TACZAN., B. S. Z. F., 1882, p. 392.—DYB., *ibid.*, 1883, p. 361.

162. **Butalis sibirica** (GM.) (p. 272.)

163. **Erythrosterna albicilla** (PALL.) (p. 273.)

164. **Anthus gustavi** SWINH. (p. 274.)

165. **Anthus japonicus** (TEMM. & SCHL.).

A. ludovicianus KITTL., Denkw., II, pp. 340, 357, 385.
A. j. DYBOW., B. S. Z. F., 1883, p. 361.

?? **Anthus blakistoni** (SWINH.).

Given by Gray (Handl., I, p. 251) as occurring in Kamtschatka, but it is probably only *A. japonicus*.

166. **Anthus cervinus** (PALL.).

Motacilla cervina PALL., Z. R. A., I, p. 511.
A. c. DYBOW., B. S. Z. F., 1883, p. 361.

167. Pipastes maculatus (HOGDS.) (p. 278.)

Anthus arboreus MIDD., Isep. Russl., p. 124.

168. Budytes flavus leucostriatus (HOMEY.) (p. 280.)

?? **Budytes citreolus** (PALL.).

Motacilla citrinella PALLAS, Z. R. A., I, p. 503:

"Ex regionibus ad Lenam, Camtschatca et insulis versus Americam sparsis habui." This species is not now known east of the Jenisej. What species can Pallas have had?

169. Motacilla melanope PALL. (p. 283.)

170. Motacilla ocularis SWINH. (p. 284.)

171. Motacilla lugens KITTL. (p. 287.)

M. alba MIDD., Isep. Russl., p. 124.

M. japonica DYB. & TACZ., B. S. Z. F., 1884, extr. p. 11.

172. Troglodytes pallescens (RIDGW.) (p. 292.)

I cannot now lay hands on any reference of a Wren having been taken on the mainland of Kamtschatka, but I believe that I have seen such a record somewhere, unless it be the vague statement by Taczanowski, J. f. Orn., 1881, p. 180. The total absence of a species of this genus, which is represented both in the Kurils, and in the Commander Islands, would be very strange.

?? **Calamophilus sibiricus** BP.

BP., Compt. Rend., XLIII, 1856, p. 414.

"Au Kamtschatka vit une race particulière de Mésange des roseaux, pour le moins aussi distincte de la nôtre que les Mésanges du Japon le sont de leurs analogues européens.

"*Calamophilus sibiricus*, Bp., *dilutissime cinamomeus, pileo vix cinereo.* Fæm. *fere unicolor, macula dorsali magna nigra; subtus candida.*"

The locality is probably as unreliable as many others from the same source.

173. Parus ater LIN.

TACZAN., B. S. Z. F., 1882, p. 390.

"Deux individus ont la nuance roussâtre plus forte qu'à l'ordinaire sur le dessous du corps." DYB., *ibid.*, 1883, p. 361.

174. Parus kamtschatkensis (BP.) (p. 297.)

175. Ægithalos caudatus (LIN.)?

Mecistura caudata TACZAN., B. S. Z. F., 1882, p. 392.—DYB., *ibid.*, 1883, p. 361.

The Long-tailed Tits from Kamtschatka probably belong to the Siberian race indicated by Mr. Seebohm.

176. Sitta albifrons TACZAN.

Sitta uralensis KITTL., Denkw., I, p. 321.

S. albifrons TACZAN., B. S. Z. F., 1882, p. 385.—DYB., *ibid.*, 1883, p. 357.

It should be remarked that Temminck's *Sitta sericea* (Man. d'Orn., 2 ed., IV, p. 645) is based in part upon a specimen from Kamtschatka.

?? **Cinclus pallasii** TEMM.

Schrenck (Reis. Amurl., I, p. 335) speaks of this species as occurring in Kamtschatka. The statement is wholly unconfirmed and probably incorrect. It is based upon the statement of Pallas (R. A., Z. I., p. 424) that "*Sturnus cinclus*" "per omnem Rossiam et Sibiriam, in Camtschatcam. . . . non infrequens observatur."

177. Acrocephalus ochotensis (MIDD.) (p. 299.)

178. Locustella hendersonii (CASS.) (p. 300.)

179. Phyllopseustes borealis BLAS (p. 302.)

180. Phyllopseustes xanthodryas (SWINH.) (p. 304.)

181. Phyllopseustes homeyeri DYBOW.

DYBOW., B. S. Z. F., 1883, p. 358.

We have no means of ascertaining the status of this alleged species.

??? **Hylocichla aliciæ** (BAIRD).

This species has been attributed to Kamtschatka by Mr. E. W. Nelson, but the statement is evidently based upon a mistake. Cf. my notes in "The Auk," 1884, p. 166.

182. Turdus eunomus TEMM. (p. 307.)

Turdus pilaris, "in Camtschatca, Stellero teste," Pallas, Z. R. A., I. p. 456, is evidently *T. eunomus*.

183. Turdus obscurus GM. (p. 307.)

Turdus chrysolaus DYBOW., B. S. Z. F., 1883, p. 359.

? **Phœnicurus auroreus** (PALL.).

Motacilla phœnicurus PALLAS, Z. R. A., I. p. 476:

"Stellerus etiam in Camtschatca et Curilis insulis dari prodidit" It is not improbable that this Red-start may occur towards the southern extremity of the peninsula.

184. Ianthia cyanura (PALL.) (p. 308.)

185. Cyanecula suecica (LIN.).

C. cœrulecula DYBOW., B. S. Z. F., 1883, p. 359.

186. Melodes calliope (PALL.) (p. 309.)

Sylvia c. MIDD., Isep. Russl., p. 125.

APPENDIX TO THE SYNOPSIS OF BIRDS REPORTED TO INHABIT KAMTSCHATKA.

APPENDIX TO THE SYNOPSIS OF BIRDS REPORTED TO INHABIT KAMTSCHATKA.

While the foregoing list is going through the press I receive the "Liste des Oiseaux du Kamtschatka et des îles Comandores, par le Dr. B. Dybowski et L. Taczanowski" (Extr. du Bulletin de la Société Zoologique de France, t. IX, 1884), which necessitates some additional remarks on my part.

Aquila nobilis PALL. is given as distinct from *A. chrysaëtos*, and both as occurring in Kamtschatka.

"*Archibuteo lagopus ferrugineus*," is given as occurring on Bering Island against *A. lagopus* from Kamtschatka. As to the identity of the Bering Island bird, see this work, p. 208. *Archibuteo ferrugineus* is a perfectly good species from Western North America, south of Washington Territory, which not even the wildest trinominalist ever thought of uniting with *A. lagopus*. Indeed, to use Dr. Coues's words, it is "one of the handsomest and most distinctively marked hawks of North America, somewhat recalling *Buteo albocaudatus*." It is "pure white underneath, from bill to end of tail, the legs rich rufous or bright chestnut, barred with black, in marked contrast; usually a few chestnut bars or arrow-heads on the belly and flanks, and the breast with sharp shaft lines of black." Taczanowski says of his birds that "Ils ont tous l'abdomen largement brun, tout le devant des parties inférieures isabelle-roussâtre, varié de stries brunes," &c. It is unnecessary to remark that they have not the faintest relation to *A. ferrugineus*. Dybowski's and Taczanowski's misidentification is most extraordinary!

Falco peregrinus.—From the comparison with the bird from Bering Island (*Falco pealei*) it appears as if the Kamtschatkan bird might be the typical *peregrinus*.

Astur palumbarius.—The authors concede, as suggested by me on p. 320, that their *atricapillus* is only the young *candidissimus*.

Asio otus should be stricken out of the list. The authors state that it was "inscrit par erreur au lieu de l'*O. brachyotus*."

Chelidon tytleri.—The authors have treated of the two Kamtschatkan swallows in an extremely confused manner. After Mr. Taczanowski, in 1883 condemned *Hirunda saturata*, which the authors call "*Hirundo rustica, saturata* Smith." (distinguée récemment dans les publications de l'Institution Smithsonienne!!) as identical with *H. gutturalis*, the authors now go so far as to even separate it from the Baical form to which they apply the new term *H. baïcalensis*. We now know that both are identical with *Ch. tytleri*. But the other form is treated of in a still more peculiar manner. In 1883 Dybowski described a swallow from Petropaulski as new under the name of *H. kamtschatica*. In the diagnosis he says: "Abdomen et sous-caudales blancs, les deux plus longues de ces dernières traversées par une large bande antéapicale noirâtre, avec un léger éclat d'acier." This form the authors now give as a synonym (Extr., p. 8) of *H. saturata*, which they describe as "Subtus intense rufa." But the very specimen (I do not think there exists in collections more specimens than the type which I have seen myself) is redescribed as *Hirundo borealis* ("pour cette forme qui paraît inédite"), as is evident from the diagnosis: "Subtus alba, subcaudalibus binis posterioribus fascia apicali nigra."

After this the synonymy of the two forms stands thus:

CHELIDON TYTLERI.

Hirundo saturata }
Chelidon saturata } Ridgway, Stejneger.
Hirundo gutturalis Taczanowski.
Hirundo rustica, saturata }
Hirundo baïcalensis } Dybowski et Taczanowski.
Hirundo rustica, baïcalensis }

CHELIDON KAMTSCHATICA.

Hirundo kamtschatica Dybowski.
Chelidon kamtschatica, Stejneger.
Hirundo borealis }
Hirundo rustica, borealis } Dybowski et Taczanowski.
Hirundo rustica, kamtschatica }

The authors assert that this form "n'est que de passage et se rend plus au nord pour le temps de la nidification." It may be permitted to ask from what source the authors have derived their knowledge as to where this bird breeds.

Turdus chrysolaus is now dropped as a Kamtschatkan bird, the authors asserting that it "nous paraît être le jeune du *T. obscurus* Gm."

Lagopus ridgwayi.—Most curiously all references to a ptarmigan occurring on the islands have been dropped altogether.

33.1. Stercorarius pomarinus.—This species is given in the "Liste" (p. 3, No. 111) under the name of *Lestris pomarina*, as occurring in Kamtschatka and Bering Island. If the information is reliable, this constitutes a veritable addition to the number of Kamtschatkan species.

Diomedea nigripes "Audub." is now given as the only albatros from Kamtschatka and Bering Island. I need hardly add that the identification is entirely erroneous, but it proves that I was completely justified in the suspicion expressed by me above under No. 35 (p. 316).

78.1. Chaulelasmus streperus.—This species is given as obtained on Bering Island. It has probably been taken during the spring migration, 1883, while I was in Petropaulski.

Merganser merganser.— The authors identify the Kamtschatkan and Bering Island birds as "*Mergus merganser americanus*," saying, however, that "Le mâle adulte ne se distingue de celui de la forme européenne que par la couleur de l'abdomen, rosée au lieu de saumon, et par le vert brillant du sommet de la tête et du cou, remplacé par le violet." Compared with what has been said above of the two species (p. 176 *seqv.*) it is plain that Messrs. Dybowski and Taczanowski are entirely mistaken in their identification.

Brachyramphus kittlitzii.—The "*Brachyramphus* sp. ?" of the former lists has now been changed to "*Synthliborhynchus* sp. ?" (*Synthliborhynchus* sic!). What is it, after all, if it is not *B. kittlitzii* ?

Cerorhinca monocerata has been dropped altogether, without good reason, as it seems.

The effect of this "Liste" upon the foregoing synopsis is as follows: We have to eliminate Nos. 35 and 122, and to add *Stercorarius pomarinus* and *Chaulelasmus streperus*. The number of well authenticated birds is, therefore, still 186, as in my synopsis.

III.—CONCLUSIONS.

It is not my intention, in the present connection, to enter into a detailed discussion of the components of the ornis of the Commander Islands, referring such conclusions to a subsequent number of my "Contributions to the History of the Commander Islands," but a few remarks as to their position in relation to the peninsula may not be out of place here.

From the second part of this book, compared with the first table, given below, it is evident that the ornis of the islands is chiefly Kamtschatkan, since only eleven species have been taken on them which do not belong to the Kamtschatkan fauna. Of these eleven only five species are of American origin, of which three are merely accidental stragglers; three are Aleutian (one extinct), and three are peculiar to the islands.

The rest of the ornis is Kamtschatkan, although among the regular inhabitants the proportion between land and water birds is considerably different from what we find on the Kamtschatkan mainland, which is well wooded while the Commander Islands can hardly show a shrub 6 feet high. That an enumeration of the birds actually taken on the islands does not bring this difference out very strikingly is due to the fact that a great many land birds, especially during the migrations, are blown over to the islands across the not more than 100-mile wide strait which separates them from the peninsula.

In now turning our attention to the fauna of the peninsula itself, we will have to base our conclusions and calculations upon the list given in the second part of this book. Meager as it is, and uncertain as the status of many of the forms enumerated still are, it is thought of sufficient accuracy to allow certain more general conclusions to be made, which may serve as a base for future investigations.

In order to obtain a correct idea of the ornis of Kamtschatka it will be necessary first to eliminate from the above list certain species which do not properly belong to it. The Commander Islands, though zoologically a part of Kamtschatka, show a certain admixture of American forms on account of their neighborhood to the other Aleutian Islands, besides possessing forms peculiar to themselves. It would, therefore, manifestly obscure the results were we to take into account those species which never have been observed on the peninsula proper, nor are likely ever to occur there except as accidental stragglers. These forms are contained in the following table, but it must be observed that it does not embrace all species which have only been recorded from the islands and not from the mainland, since such forms which have, probably, only been overlooked on the latter, especially Circumpolar, Palæarctic, Pacific, and East-Asiatic forms, may be regarded as truly Kamtschatkan.

TABLE I.—*Birds, American or peculiar to the Commander Islands, which do not occur in Kamtschatka.*

Heteractitis incanus.
Olor columbianus.
Mareca americana.
Charitonetta albeola.
Phalacrocorax perspicillatus.
Lagopus ridgwayi.
Falco pealei.
Haliæetus leucocephalus.
Corvus behringianus.
Leucosticte griseonucha.
Troglodytes pallescens.

This virtually reduces the number of Kamtschatkan birds to 175.

Before entering into a discussion of their geographical distribution it may be well to show to which geographical categories the different species belong.

TABLE II.—*Circumpolar forms.*

Colymbus auritus.
Urinator adamsii.
arcticus.
lumme.
Larus glaucus.
Gavia alba.
Sterna paradisæa.
Stercorarius parasiticus.
longicaudus.
pomarinus.
Oceanodroma leucorrhoa.
Arenaria interpres.
Charadrius squatarola.
Calidris arenaria.
Phalaropus lobatus.
Crymophilus fulicarius.
Chen hyperboreus.
Anas boschas.
Dafila acuta.
Chaulelasmus streperus.
Spatula clypeata.
Histrionicus histrionicus.
Harelda hyemalis.
Eniconetta stelleri.
Somateria spectabilis.
Merganser serrator.
Lagopus lagopus.
Falco rusticolus.
islandus.
Archibuteo lagopus.
Aquila chrysaëtos.
Asio accipitrinus.
Nyctea nyctea.
Plectrophenax nivalis.
Calcarius lapponicus.
Acanthis linaria.
holbœllii.
Pinicola enucleator.
Ampelis garrulus ?

TABLE III.—*Palæarctic forms.*

Larus canus.
    ridibundus.
Gallinago gallinago.
Actodromas temminckii.
Totanus nebularius.
    ater.
    glareola.
Pavoncella pugnax.
Actitis hypoleucos.
Olor cygnus.
Nettion crecca.
Querquedula querquedula.
Mareca penelope.
Aythya fuligula.
    marila.
Clangula clangula.
Merganser merganser.
Mergus albellus.
Lagopus mutus?
Falco peregrinus?
    subbuteo.
Accipiter nisus.
Haliæetus albicilla.
Pandion haliætus.
Surnia ulula.
Nucifraga caryocatactes.
Corvus corax.
Emberiza schœniclus?
Fringilla montifringilla.
Coccothraustes coccothraustes?
Loxia, sp.
Clivicola riparia.
Anthus cervinus.
Motacilla melanope?
Parus ater?
Ægithalos caudatus?
Cyanecula suecica.

TABLE IV.—*Pacific forms.*

Uria lomvia arra.
    troile californica.
Cepphus columba.
    carbo.
Brachyramphus marmoratus.
    kittlitzii.
Synthliboramphus antiquus.
Simorhynchus pygmæus.
    cristatellus.
    pusillus.
Cerorhinca monocerata.
Cyclorhynchus psittaculus.
Lunda cirrhata.
Fratercula corniculata.
Larus glaucescens.
    schistisagus.
    cachinnans.
    kamtschatkensis.
Rissa tridactyla pollicaris.
    brevirostris.
Diomedea albatrus.
Fulmarus glacialis glupischa.
Puffinus tenuirostris.
Oceanodroma furcata.
Arquatella couesi.
Somateria v-nigra.
Phalacrocorax urile.
    pelagicus.

TABLE V.—*American forms.*

Colymbus holbœllii.
Pelidna alpina pacifica.
Anser albifrons gambeli.
Branta canadensis hutchinsii.
Branta nigricans.
Oidemia americana.
    deglandi.
Acanthis hornemannii exilipes.

TABLE VI.—*Siberian forms.*[*]

Charadrius dominicus fulvus.
Ægialitis mongola.
Gallinago hyemalis?
Terekia cinerea.
Hypocentor aureolus.
Hypocentor rusticus.
Lanius sibiricus.
Anthus gustavi.
Phyllopseustes borealis.

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[*] By "Siberian forms" are meant species inhabiting the whole portion of the Palæarctic region east of the Ural Mountains, besides a few forms which have pushed their outposts farther west, toward the Baltic, but without reaching the Atlantic Ocean.

TABLE VII.—*East Asiatic*[*] *or peculiar forms.*

Sterna camtschatica.
Hæmatopus osculans.
Actodromas acuminatus.
damacensis.
ruficollis.
Limosa lapponica baueri.
ægocephala melanuroides.
Pseudototanus guttifer.
Heteractitis brevipes.
Numenius cyanopus.
phæopus variegatus.
Grus grus orientalis ?
Anser segetum middendorffi.
Cygnopsis cygnoides.
Eunetta falcata.
formosa.
Urogallus parvirostris kamtschaticus.
Astur candidissimus.
Haliæetus hypoleucus.
Thalassoaëtus pelagicus.
Cuculus canorus telephonus.
peninsulæ.
Dryobates purus.
immaculatus.
Picoides albidior.
Micropus pacificus ?
Alauda blackistoni.
Corvus corone lavaillantii.
Pica camtschatica.
Hypocentor variabilis.
Leucosticte brunneonucha.
Chloris kawarahiba.
Pyrrhula pyrrhula kamtschatkensis.
Carpodacus erythrinus grebnitskii.
Chelidon tytleri.
kamtschatica.
Lanius cristatus.
Butalis sibirica.
Erythrosterna albicilla.
Anthus japonicus.
Pipastes maculatus.
Budytes flavus leucostriatus.[†]
Motacilla ocularis.
lugens.
Parus kamtschatkensis.
Sitta albifrons.
Acrocephalus ochotensis.
Locustella hendersoni.
Phyllopseustes xanthodryas.
homeyeri.
Turdus eunomus.
obscurus.
Ianthia cyanura.
Melodes calliope.

The number of species of each group and their percentage, as compared with the total number of Kamtschatkan birds, 175, may be tabulated thus:

TABLE VIII.

39 species are *Circumpolar*, or about	22.3 per cent.
37 species are *Palæarctic*, or about	21.1 per cent.
28 species are *Pacific*, or about	16. per cent.
8 species are *American*, or about	4.6 per cent.
9 species are *Siberian*, or about	5.1 per cent.
54 species are *East Asiatic or peculiar*, or about	30.9 per cent.

This includes all the birds which are supposed to have been obtained in Kamtschatka. The ornis of a country does not properly consist of all these, as in most cases a considerable number of occasional and accidental visitors enter the faunal lists, which, strictly, should be kept aside as foreign elements. The list of Kamtschatkan birds, however, appears to embrace but very few forms which do not occur regularly in one or the other part of the peninsula. There are apparently four causes of this peculiarity of the list, the first being that comparatively few irregular visitors find their way to it on account of its isolated position; second, that no general migration route between countries to the north and south seems to pass through the region; third, that the extreme districts which adjoin neighboring regions are entirely unexplored; and fourth, that, since Steller's time, no ornithologist who was a hunter himself has resided in the country for more than a few months. In thickly settled countries, where all the common birds are known, every unusual and rare visitor is soon found out and reported (cf. 165 occasional visitors, against 211 regular inhabitants of the British ornis); but not so in Kamtschatka, where the 175 names may practically be regarded as representing the number of species actually belonging to the fauna.

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[*] Such forms are regarded as East Asiatic which, ordinarily, do not occur west of the Jenisej River.

[†] This form, belonging to an exclusively Palæarctic group of birds, is here treated as Asiatic, notwithstanding the fact that a small colony breeds in Northern Alaska.

But not all of these throw particular light upon the relationship of the ornis, except in a general way. Many forms are so generally distributed over large areas and show so little variation that they are less fit to illustrate those features of the geographical distribution, which are of special interest. Others again are so closely limited in their distribution by the character of the localities they inhabit as to give very unreliable material for comparison. This is eminently true of many water birds, a great many of which in their distribution characterize the faunal areas of the ocean and not those of the land. They will therefore have to be considered separately. It will be seen that in this case, at least, the habits have a considerable influence upon the geographical distribution; the old-fashioned system, chiefly based upon teleological characters, may therefore, in this connection, offer some advantages over those aiming at morphological characters for their basis. For this purpose we shall partly apply a division of the birds into "swimmers," "waders," "game birds," "birds of prey," "picarians," and "perchers," in the old sense of these appellations, a course which, in some measure, will facilitate a comparison of some of the results here arrived at with those of earlier writers.

The old observation that the proportional number of species of water birds (swimmers and waders) increases toward the Arctic region is confirmed by the following table, which shows that of all the birds occurring in Kamtschatka the species of water birds are more numerous than those of the other divisions together:

TABLE IX.

70 swimmers, or	40. per cent.
29 waders, or about	16.6 per cent.
3 game birds, or about	1.7 per cent.
15 birds of prey, or about	8.6 per cent.
6 picarians, or about	3.4 per cent.
52 perchers, or about	29.7 per cent.

Recalling what we said above in regard to the peculiarity of birds living at the sea characterizing the marine regions rather than the terrestrial provinces of the earth, we at once direct our attention to the 70 species of Kamtschatkan "swimmers" or "*natatores*" of some systematists.

The swimmers are divisible into two categories, marine and fluviatile natatores, the former group being, of course, the one of interest in the present connection. It embraces the following species:

TABLE X.—*Kamtschatkan Marine Natatores.*

1. Uria lomvia arra.
2. troile californica.
3. Cepphus columba.
4. carbo.
5. Brachyramphus marmoratus.
6. kittlitzii.
7. Synthliboramphus antiquus.
8. Simorhynchus pygmæus.
9. cristatellus.
10. pusillus.
11. Cerorhinca monocerata.
12. Cyclorrhynchus psittaculus.
13. Lunda cirrhata.
14. Fratercula corniculata.
15. Larus glaucescens.
16. glaucus.
17. Larus schistisagus.
18. cachinnans.
19. kamtschatkensis.
20. canus.
21. Rissa tridactyla pollicaris.
22. brevirostris.
23. Gavia alba.
24. Stercorarius pomarinus.
25. Diomedea albatrus.
26. Fulmarus glacialis glupischa.
27. Puffinus tenuirostris.
28. Oceanodroma leucorhoa.
29. furcata.
30. Eniconetta stelleri.
31. Somateria v- nigra.
32. spectabilis.
33. Phalacrocorax urile.
34. pelagicus.

Of these thirty-four species there are only two, viz, *Cepphus carbo* and *Larus kamtschatkensis*, which have not been observed on both sides of the Pacific Ocean. The peculiar character of these birds is furthermore evident from the fact that most of them are exclusively Pacific in their distribution, only seven species, viz,

Larus glaucus,
canus,
Cavia alba.
Stercorarius pomarinus.
Oceanodroma leucorhoa,
Eniconetta stelleri, and
Somateria spectabilis,

being inhabitants of the Atlantic shores too. In other words, about

80 per cent. of the marine natatores are peculiar to the Pacific. Even more striking, perhaps, is the proportion of the genera, since of twenty genera not less than six, or 30 per cent., are peculiar.

Not less remarkable is the fact that nearly all the Pacific forms are to be found among the marine natatores, since of the one hundred and forty-two species which belong to other categories only one, viz, *Arquatella couesi*, a wader, can be designated as strictly and exclusively Pacific.

If we now look at the remaining swimmers, fluviatile and fluvio-marine, we will find that the great majority of them, or 70 per cent., are Circumpolar or Palæarctic, only the following eleven species being exceptions:

TABLE XI.—*Fluviatile Natatores not Circumpolar nor Palæarctic.*

Colymbus holbœllii.
Sterna camtschatica.
Anser segetum middendorffi.
    albifrons gambeli.
Branta canadensis hutchinsii.
    nigricans.
Cygnopsis cygnoides.
Eunetta falcata.
    formosa.
Oidemia americana.
    deglandi.

Of these more than one-half (six) are species which are also generally distributed in America. While, therefore, these forms indicate a certain influence of that continent, the character and real insignificance of this influence is manifested by the fact that in the other divisions only two species are American, viz, one wader and one percher, *Pelidna alpina pacifica* and *Acanthis hornemannii exilipes*. The number of American forms is surprisingly small indeed.

While thus the American element is smaller than might, perhaps, be expected, the Circumpolar and Palæarctic forms are quite predominant, as a matter of course, making not less than 43.4 per cent. of the whole number of species, or nearly 52.5 per cent. of all the species, minus those of the water birds which are peculiarly Pacific. (Table IV.)

Table XII is prepared to show at a glance the number and percentage of the species of each division as contained in the different ornitho-geographical categories.

TABLE XII.

	Swimmers.		Waders.		Game birds.		Birds of prey.		Picarians.		Perchers.		Total number.	Per cent. of 175 species.
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.		
Circumpolar	21	30.	5	17.	1	33.3	6	40.	0	0.	6	11.5	39	22.3
Palæarctic	11	15.7	7	24.	1	33.3	6	40.	0	0.	12	23.1	37	21.1
Pacific	27	38.6	1	3.5	0	0.	0	0.	0	0.	0	0.	28	16.
American	6	8.6	1	3.5	0	0.	0	0.	0	0.	1	2.	8	4.6
Siberian	0	0.	4	14.	0	0.	0	0.	0	0.	5	9.6	9	5.1
East Asiatic or peculiar	5	7.1	11	38.	1	33.3	3	20.	6	100.	28	53.8	54	30.9
Total number	70		29		3		15		6		52		175	

The preponderance of East Asiatic and peculiar forms, both on the whole, and especially in those groups which are of most value for the study of the geographical distribution, is clearly demonstrated by this table. We are, therefore, justified in taking the birds contained in this category as a basis in attempting an analysis of the Kamtschatkan ornis, and a comparison of it with that of adjacent countries.

Referring to Table VII, page 338, for an enumeration of the species, the geographical relations of which we are going to discuss here, we may at once tabulate those forms which we regard as peculiar to the peninsula.

TABLE XIII.—*Species peculiar to Kamtschatka.*

Urogallus parvirostris kamtschaticus.
Astur candidissimus.
Haliæetus hypoleucus.
Dryobates purus.
immaculatus.
Picoides albidior.
Pica camtschatica.
Pyrrhula pyrrhula kamtschatkensis.
Parus kamtschatkensis.
Sitta albifrons.

It will be seen that this enumeration only comprises residents and none of the several migratory birds which have not yet been reported from any other country, or which breed nowhere except in Kamtschatka. Some one might urge that a species which only breeds in Kamtschatka is peculiar to that country. This is true to a certain degree, but our knowledge of the localities where many or most of the species in question breed, or do not breed, is at present so imperfect as to make the above selection advisable.

The other residents (the exact number of which, as compared with that of the migrants, cannot be ascertained at present), are nearly all Circumpolar or Palæarctic species of wide distribution. Most of these are species which retain a great uniformity all over their enormous range, except a few ones, for instance, *Coccothraustes*, *Parus ater*, *Ægi-*

thalos caudatus, and *Lagopus muta*, which we suspect to be really distinguishable, not having had the opportunity of a personal inspection of specimens.

All the peculiar forms attributed to Kamtschatka, according to Table XIII, are very closely related to Palæarctic forms, with the exception of *Haliæetus hypoleucus*, the status of which is somewhat doubtful, so as to justify us in excluding it from the present discussion. But these forms belong to a class quite different from those mentioned above, being, as they are, of considerable variability, so as to possess representative conspecies or subspecies in the different provinces of the Palæarctic region.*

We have therefore simply found what we, *a priori*, might have expected, viz, that those variable forms which in other countries have been modified, more or less, would show corresponding modifications when occurring in a country of so peculiar a character and so great isolation as the Kamtschatka Peninsula.

The character and amount of this modification is remarkable in several respects. In every instance it consists in an increase of the white color as compared with the nearest allied forms. In fact, *all the peculiarly Kamtschatkan birds possess a greater amount of white than any of their allies, wherever these may reside.* So extreme is this tendency towards whiteness that one species, *Astur candidissimus*, has become entirely white, while another, *Parus kamtschatkensis*, is nearly so.

The example of the Kamtschatkan ornis shows conclusively that the theory of climatic conditions producing the geographical subspecies, races, or whatever they may be styled, does not hold good, at least as far as the increase of the white color at the cost of the others, especially of black, is concerned. It was already recognized long ago, as far back as Gloger's earliest days, that the Siberian ornis generally showed a tendency toward an increase of the white color. A similar tendency seemed to obtain in forms living nearer the Arctic, and consequently it was concluded that the white color was due to the increased cold. Finding now that the peculiar Kamtschatkan forms are considerably whiter than in any other part of Siberia, the natural inference would be that Kamtschatka had a climate much severer than any other place. Since we know that such is not the case, however, the logical conclusion is that the theory of the cold being the direct cause of the increase of the white color must be erroneous. Nor can it be the northerly position, for these white forms are found at 53° north latitude. The peculiarities of a continental climate will not suffice for an explanation, since Kamtschatka is a peninsula surrounded by great sheets of water on nearly all sides.

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* It is interesting to remark in this connection, that all the peculiar forms (with the above exception) have nearly allied representatives in Northwestern Europe.

It may be well to remark that this increase of white is not in the nature of a bleaching or fading of the darker color. They are simply replaced by pure white, and the parts of the body which in the allied forms are white have this color still purer and more dazzling in the Kamtschatkan forms. In the same manner the other colors seem to be purer and, in many instances at least, to be more intense also. The color which seems to suffer most reduction is the black one, but, as remarked, it is only in extent, not in intensity. Without offering any theory for the solution of the question, at present, I would only call attention to the fact that, while the black color of the feathers is due to a pigment, the white color is not, it being caused by the accumulation of colorless air-filled cells. In respect to the changes within the individual feathers we know as yet next to nothing, and not until it has been ascertained what are the causes and the nature of the changes in the individual feather, can a trustworthy theory be advanced concerning the modifications of the color in the species generally.

As already indicated, the rest of the resident species are widely distributed Circumpolar and North-Palæarctic forms which consequently occur in the neighboring countries as well, and therefore are of little interest in the present connection. A few words only need be said about three of these species. The Raven of Kamtschatka has been separated as peculiar under the name of *Corvus corax kamtschaticus.* Not having seen specimens we are unable to appreciate the alleged differences from the common stock. This may be our fault, or that of the description, but we should not be surprised if the race ultimately should prove to be valid, and only remark that the Raven has not yet been found in Japan proper, specimens having only been obtained in the Kuril Islands. The other species worthy of a few remarks is *Leucosticte brunneonucha.* A bird which has been called by that name is well known from Japan, and the National Museum possesses specimens from Vladivostok, on the Asiatic mainland, on the opposite side of the Japan Sea. It is reported from the Kuril Islands, and also from the eastern coast of the Kamtschatkan Peninsula. The genus *Leucosticte* is Asiatic and American in its distribution, and most of the species show a great tendency to split up into geographical subspecies or races. We have not had an opportunity of comparing Kamtschatkan specimens with those from more southern localities, and shall therefore abstain from any further remarks beyond calling attention to the importance of having a very careful and minute comparison made, and to the fact that Pallas's "*Passer arctous* var. β, 1" from the Kurils, has not been rediscovered yet. The third species alluded to is *Surnia ulula*, which is not known from Japan. Descriptions of Kamtschatkan specimens indicate some differences, chiefly increased amount of the white color, which may ultimately secure for them recognition as a race.

When now directing our attention to the migratory summer visitors, their distribution and their migration routes, we sadly miss satisfactory information as to the ornis to the north and east of Kamtschatka. Several travelers have collected on the western and northern shores of the Okotsk Sea; but, in the first place, they remained only a short time in a few localities, and there is no special list from that region with sufficient details concerning localities, &c. Still worse is the fact that what scanty information we have is next to worthless. Middendorff and v. Schrenck are the chief collectors in that region, but, unfortunately, they are also the chief sinners in "lumping" allied forms, so that for the solution of questions of this character it is impossible to tell with certainty which forms they had before them, except perhaps in a few cases (cf. later on in regard to the Swallows, p. 347). No example could more strikingly illustrate the deplorable results of that kind of science, and none could more forcibly demonstrate the necessity of those nicer distinctions which ornithologist of the other school, with becoming toleration, have styled "hair-splitting."

Fortunately, the ornis of the country to the south of Kamtschatka is in a better condition, thanks to Capt. Thomas Blakiston's more than twenty years of intelligent collecting and study in Japan. The Kuril Islands, it is true, are still very little known, but also from there we have, through Mr. Blakiston, received much valuable information.

As a matter of course, most of the summer visitors to Kamtschatka occur also in Japan, either breeding, transient, or wintering, and when the specimens from the two countries are absolutely identical it may be safe to assume that the Kamtschatkan birds migrate southward directly to Japan along a route following the Kuril chain of islands. There are, however, a number of species regularly occurring in Kamtschatka as summer visitors which do not pass through Japan on their way southward. Once in a while a single straggler is likely to be captured in the latter country, but they do not occur there regularly twice a year when going south and north. Nor will the assumption of insufficient observations help us explain the absence of these species from the Japanese fauna, several of the forms being so conspicuous that it is absolutely impossible they could have been overlooked if regularly passing through, as will be seen by an inspection of the table. A few forms, nearly related to species breeding in Japan, may, perhaps, have been overlooked in the latter country, and are therefore in the table indicated by a ? in front of the name.

TABLE XIV.—*Summer visitors to Kamtschatka which do not pass through Japan on their way southward or northward.*

Sterna paradisæa.
?Actodromas temminckii.
Pseudototanus guttifer.
Pavoncella pugnax.
?Cuculus peninsulæ.
Calcarius lapponicus.
Carpodacus erythrinus grebnitskii.
Chelidon tytleri.
?Chelidon kamtschatica.
Lanius cristatus (?)
Erythrosterna albicilla.
Anthus gustavi.
Budytes flavus leucostriatus.
?Phyllopseustes homeyeri.
Cyanecula suecica

It is doubtful whether *Butalis sibirica* should not be included in this list, as it does not seem to be common in Japan. As it has been taken there, however, it has been thought safer to exclude it.

From the above list is also omitted *Emberiza schœniclus*, since we do not know the exact status of the Kamtschatkan birds. Taczanowski assures us that they are typical, but we are nevertheless by no means certain that they do not belong to the form occurring in Japan.

The migration route over the Kuril Islands and Japan seems to be so natural that it is greatly perplexing to find that it is not the only one for all the birds of Southern Kamtschatka going south in autumn and returning north in spring again. But while we are forced to admit that they take another way, the fact is an additional evidence in favor of the theory of comparatively narrow and limited routes.

It is at present impossible to fix the direction of this migration route in general, and we shall indulge in no guess-work.

One species, however, may perhaps be traced part of the way, and may therefore merit detailed consideration, since its history seems to contain some valuable hints. We refer here to *Chelidon tytleri*, which is known from Kamtschatka, Dauria, and India. Messrs. Middendorff and v. Schrenck usually mix such forms together under one name which we regard as species or subspecies worthy of separate names (*cf.* also the remarks above, on p. 345). So also in the present case, as the eastern *Chelidones* are lumped together as *Hirundo rustica* var. *rufa.* Usually it is nearly impossible to extricate the observations belonging to the different forms, but in this case the difference between *Ch. gutturalis* and *Ch. tytleri* was too great for even v. Schrenck to ignore altogether, though he by no means suspects them of being separable, much less understands the importance of keeping them separate*.

Fortunately his remarks enable us to decide which forms he and Middendorff collected at two very important localities. Speaking of the "*Hirundo rustica* var. *rufa*," which he found throughout the Amur Valley (Reise Amurl. I, p. 387), he observes that it was "much paler than the old male among Middendorff's specimens from Udskij Ostrog, and only slightly darker than the old male of the European Barn Swallow. * * * The black band of the fore neck is only narrow and contains some rusty brown spots."†

This description is quite sufficient for identifying the Amur Valley bird as *Ch. gutturalis*, while on the other hand, the remark plainly shows that the bird Middendorff collected at Udskij Ostrog, at the mouth of the Uda Valley, is *Chelidon tytleri.* This determination is extremely interesting since the valleys of the two rivers Amur and Uda are close together, only being separated by the Bureja Mountains, but the direction of the Amur and Ussuri is southern, while Uda comes from the west. The Stanovoj Mountains, which until this point run close to the shore of the Okotsk Sea, make here a sudden bend to the westward, leading over to Dauria and Transbaikalia. According to Middendorff (Isepiptesen Russl., p. 125) Vossnessenski met "*Hirundo rustica* var. *rufa*" at Ajan. We also know that *Ch. tytleri* is common on the western coast

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*That v. Schrenck writing as he did, before the theory of evolution was fairly developed and understood, and before the recent theories of the bird migration, which are so closely connected with the former, had been conceived, is perhaps not so very surprising. That Taczanowski, however, still, in 1883, refuses to recognize the difference between *gutturalis* and *tytleri* (= *saturata*) (*cf.* his foot-note on p. 356, Bull. Soc. Zool. France, 1883, in regard to the latter form), and fails to see the necessity of tracing the geographical distribution of each one separately, is a matter both of surprise and regret.

†"Viel blässer als das alte Männchen unter den Middendorffschen Exemplaren von Udskoi Ostrog, und nur wenig dunkler als das alte Männchen der europäischen Rauchchwalbe. * * * Das schwarze Band der Kropfgegend ist nur schmal und trägt einige rostbraune Flecke."

of Kamtschatka. We know that it does not travel southward over the Kuril Islands and Japan. It seems, then, a pretty safe conclusion, that the Swallow, at least, crosses the Okotsk Sea from some point on the western coast of Kamtschatka, and that when arriving on the opposite coast of the Okotsk Sea it meets the Stanovoj Mountains, it follows the eastern slope of that range southward, turning westward at Udskij Ostrog where the mountains also turn westward.

I have remarked above that this case may offer a hint as to how the other species migrate, which do not pass over Japan. I do not mean to say, however, that the other species probably follow exactly the same route; in fact, I do not intend to propose any theory as to them, since what we know about them is too fragmentary. To illustrate this I may mention *Carpodacus erythrinus grebnitskii.* Middendorff met it at Udskij Ostrog and v. Schrenck in the Amur Valley. But as the species breeds there, it is—with our present knowledge—impossible to say whether the Kamtschatkan individuals migrate along the Uda only, or if they also go by the Amur route. If only the Amur birds had a single character of their own, no matter how slight, no matter how keen and trained the eye of the expert must be to discover it, what an advantage! And still there are people who call the search for such fine distinctions "hair-splitting!" Could we possibly get more forcible examples to illustrate the absolute necessity of diligently practicing this noble art of "hair-splitting" than the above ones of *Chelidon tytleri* and *Carpodacus grebnitskii?*

To the north, or rather the northeast of Kamtschatka, lies a country larger than Great Britain, which is totally unknown, at least as far as its birds are concerned. Roughly speaking, it is situated between 60° and 66° north latitude, and between 195° and 180° west longitude, being the whole river area of the Anadir and its numerous tributaries. Although bordered to the northwest by the northern arm of the Stanovoj Mountains, this vast area is undoubtedly inhabited by a considerable number of Siberian forms of migratory birds, but as we know absolutely nothing of the ornis of the region its relation to that of Kamtschatka can only be guessed at.

Still further to the northeast is the Tschuktschi Peninsula, the ornithology of which is a little better known. We have scattered notes by the many travelers who stopped a few days in Plover Bay. Nordenskiöld, wintering at Pitlekaj, has furnished valuable observations covering nearly a year. Finally the Russian Transit-of-Venus Expedition brought home a few species of birds from Tschukotskij Noss.

Scanty as this material is, both on account of the limited extent of the explorations and the northern situation of the country (64 to 67° north latitude), it is better than nothing, and will suffice for some interesting observations. It will be necessary first to give a list of the summer visitors of that region, which are of importance in the present connection. We have, consequently, left out all the strictly American forms which in summer visit the Tschuktschi Peninsula.

TABLE XV.—*Palæarctic Summer Visitors (Land Birds and Fluviatile Waders) known to occur on the Tschuktschi Peninsula.*

Arenaria interpres.
Charadrius squatarola.
dominicus fulvus.
Ægialitis hiaticula (?)
Eurynorhynchus pygmæus.
Eudromias morinellus.
Actodromas acuminatus.
temminckii.
Pelidna ferruginea.[*]
Calcarius lapponicus.
Anthus gustavi.
japonicus (?)
cervinus.
Budytes flavus leucostriatus.
Motacilla ocularis.
Phyllopseustes borealis.
Turdus iliacus (?)
naumanni (?)
Saxicola œnanthe.

In spite of the meagerness of this list, it confronts us at once with the very important fact that it contains a number of species which have not yet been obtained in Kamtschatka, and most of which, probably, do not occur there regularly, viz:

Ægialitis hiaticula (?)
Eudromias morinellus.
Pelidna ferruginea.
Eurynorhynchus pygmæus.
Motacilla ocularis.
Turdus iliacus (?)
naumanni.
Saxicola œnanthe.

In this connection I wish to recall what I have said previously in this work (p. 283 and p. 303) in regard to *Budytes leucostriatus* and *Phyllopseustes borealis*, viz, that there seems to be a slight difference between the stock inhabiting Alaska (and the opposite shore of Asia) and the one which passes the summer in Kamtschatka, indicating that the former never touches the latter country during their migrations.

---

[*] = *Tringa subarquata* GÜLDENST. Brünnich's name has the priority as will be seen from the following list of the chief synonyms:

1764.—*Tringa ferruginea* BRÜNN., Orn. Bor., p. 53.
1775.—*Tringa subarquata* GÜLD., Nov. Comm., Petrop., XIX (p. 471, pl. 18).
1809.—*Numenius pygmeus* BECHST., Naturg. Deutschl., IV, p. 148.
1826.—*Trynga falcinella* PALL., Zoogr. Ross. As., II, p. 188.

We know for certain that none of the above species migrate southward along the American coast, not even those which regularly visit Alaska in summer. They must, therefore, migrate south through some part of Northeastern Asia, since they do not stay near Bering Strait in winter. That all of them should have been overlooked in Kamtschatka is not probable. It may, at least, be taken for granted that they do not regularly pass up and down the eastern coast twice a year.

It is, in this connection, a significant fact that these same birds do not regularly occur in Japan either, with the possible exception of two, viz, the birds which in Table XV are called *Ægialitis hiaticula* and *Turdus naumanni*. The former is not found in Japan; on the other hand, the nearly allied *Ægialitis placida* is common in winter about Yokohama, and the bird which Nordenskiöld brought home from the winter quarters of the "Vega" may have been this species and not the true *hiaticula*. The true *Turdus naumanni* TEMM. is included in the Japanese fauna, but Blakiston and Pryer say that it "does not seem to be abundant." It is to be remarked that Middendorff met this species on the western shore of the Okotsk Sea, at Ajan, and in the Stanovoj Mountains (54½° and 59½° north latitude), but that he erroneously calls it *Turdus ruficollis*.

In regard to *Eurynorhynchus pygmæus* it must be observed that, although several specimens have been obtained in Japan, it is not known to occur there regularly. Still the fact that this bird, in spite of its most extraordinary bill, has escaped notice in other places until recently, makes it less safe to base any conclusions upon the negative evidence of its not having been recorded from a given locality. This species needs close watching everywhere in Eastern Asia, for not only is it a rare and curious bird, but it is confidently expected that considerable light will be thrown upon the migrations of that region when the route of the Spoonbilled Sandpiper shall have been mapped out.

The migratory inhabitants of the Tschuktschi Peninsula, which in fall go south to winter in some part of Eastern or Southern Asia, are most likely to follow the southern coast of the peninsula westward, or to cross the Bay of Anadir, in both cases reaching the great river system of Anadir. A glance at the map will convince us that they do not cross the range of the Stanovoj Mountains, which here separate the Anadir system from that of the Kolima. The direction of this mountain range is southwest, and parallel with it is another mountain system along the coast. Between these and in the same direction runs the river, notably the tributary Orlovka. A route following the latter points directly towards Penschinsk at the innermost northeastern corner of the Okotsk Sea. The Stanovoj Mountains, here approaching the coast, bend westward and run parallel with the coast, but at some distance from the sea, as far as Okotsk; but at the latter place, whence the coast bends southwest again, that lofty mountain chain moves out close to the shore. At about 55° north latitude, the mountains again turn westward, the valley of Uda leaning on their southern slope. Since we know that the birds alluded to do not move southward from Penschinsk, through Kamtschatka, and since their escape westward is effectually prevented by the snow-clad Stanovoj Mountains, the route between the mountains and the coast becomes the only available road to the south. Arriving at Udskij, they have the choice of at least two routes.

We shall now take one of the above species as an illustration of the hypothesis here mapped out, selecting for that purpose *Motacilla ocularis*, the Wagtail, with gray back in both sexes and at all seasons. We remark at the outset that one specimen of this species has been taken in Kamtschatka* and another one on Bering Island; but these were evidently stragglers, as was the specimen which was collected by Mr. Belding at La Paz in Lower California. This species is a regular breeding bird on the Tschuktschi Peninsula, and all the various parties which have collected at Plover Bay obtained or observed it. It is true that we know of no authentic record of this species, as distinguished from the other eastern white Wagtails, having been collected at any intermediate point, but from v. Schrenck's description of the specimens which Middendorff collected at Udskij Ostrog it is clear that the latter are true *ocularis*. But there seems to be no other possible way than that indicated above, when the birds do not migrate over Kamtschatka and Japan. From Udskij Ostrog they must follow the same route to Dauria and Baikal which we have indicated on a previous page when discussing the migration of *Chelidon tytleri*. The evidence is that the species is common in the districts just mentioned, while it is missing in the Amur Valley and farther east, it being undoubtedly a black-backed form that occupies the Amur district. This close analogy with the Swallow is very interesting and suggestive. Still more light may be thrown upon the subject if we consider the distribution and migration of allied forms. *Motacilla lugens* is the species which breeds over the greater part of the Kamtschatkan Peninsula. We also know it to breed on the Kurils and on Yesso, Japan. Concerning its distribution in the latter country we quote the following from Captain Blakiston (Amend. List B. Jap., p. 54): "On the last [Yesso], however, it appears to breed but sparingly, and has not been observed on the main island, or anywhere in Southern Japan during that season. *In September and October it is numerous on migration in Yesso*, but I believe none winter there. To the southward, we have winter specimens from Yokohama, Kobé, Nagasaki." I think there is no danger in assuming that the birds which "in September and October are numerous on migration in Yesso" come from Kamtschatka. In now directing the attention to the birds living at the Amur, I may repeat what I emphasized when speaking of the purple finch: "If only the Amur birds had a single character of their own, no matter how slight, no matter how keen and trained the eye of the expert must be to discover it, what an advantage!" Now, whether such a character exists I do not know, since I have no Amur specimens, but I really suspect that it does. I take my suspicion from v. Schrenck's description, which distinctly says, that his Amur specimens differ both from Middendorff's examples and from the Kamtschatkan ones, being in a measure intermediate between them.* I think there are good reasons for the belief that the birds in question will turn out to be entitled to a name, as *Motacilla lugens amurensis* (SEEBOHM), the author of which, perhaps, after all did not "commit so great a crime" in creating the last name as he himself fears. But it must be left to future investigations to decide whether there exists such a "migration-route race," as friend Palmén would call it.

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* Mr. Taczanowski now considers his previous identification erroneous, referring the specimen in question to *M. lugens*, with which he wrongly identifies *M. japonica*. *Cf.* Dyb. and Tacz., B. S. Z. F. 1884, Extr., p. 11.

We shall now apply Palmén's theory that the migration routes indicate the ancient ways by which the species originally immigrated into a country as a test to the cases of the Wagtail and the Swallow. We are, then, probably justified in taking the present center of distribution of *Motacilla ocularis* and *Chelidon tytleri* as the starting point from whence they gradually invaded those outlying regions where we have made their acquaintance. It will suffice for our present purpose to start from the region east of Lake Baikal, the so-called province of Transbaikalia. The effort of the species to extend the limits northward and eastward forced them to move eastward gradually along the southern slopes of the Jablonnoj and Stanovoj Mountains, finally, by degrees, reaching the Okotsk Sea at Udskij. From here they only had the narrow slip of land between the sea and the high Stanovoj Mountains, which they could not cross. Year after year the pioneers advanced a little farther to the northeast. Finally the swallow reached a latitude beyond which it was not comfortable for it to proceed. But a glance at the map (p. 359) will show us that the sea separating it from Kamtschatka is too insignificant an obstacle for the swift swallow, which found suitable quarters and plenty of food in the mosquito-ridden peninsula, where it found no very nearly related competitor. The wagtail, on the other hand, could stand the northern climate better, and pushed on until the outposts reached the shores of Berings Strait, across which they will probably continue their emigration before long. That *Motacilla ocularis* in reaching Penschinsk did not extend southward over the peninsula may be explained by the fact that it found Kamtschatka already occupied by the closely allied *Motacilla lugens*.

---

* "So sehen wir also die Amur-Exemplare der Var. *lugens* in ihrer Färbung in jeder Beziehung den Uebergang von den dunkelsten, am prägnantesten schwarz und weiss gezeichneten Form des maritimen Ostasiens, wir meinen Kamtschatka's, der Kurilen und Japan's, zu der viel helleren und mehr grauen Form des continentalen Ostasien's." Schrenck, Reise Amurl., I. p. 340.

On a former occasion I have made the remark that Kamtschatka is not only interesting on account of the birds it possesses, but, perhaps, even more so on account of those which are absent from its ornis. To illustrate this more fully we shall undertake a comparison with the avifauna of the district at the mouth of the Amur River and at Udskij Ostrog, giving in a table all the species especially mentioned as collected by v. Schrenck and Middendorff in the former localities, which are situated at about the same latitude as Petropaulski, and not known to occur in Kamtschatka. Such forms are excluded, however, which may be regarded as representing each other, as for instance, the corresponding races of *Urogallus*, the different forms of woodpeckers, &c. I have retained his nomenclature without any changes, since in many cases it is difficult to decide, without specimens, the exact name of the species which he collected.

TABLE XVI.—*Species collected at the Mouth of the Amur River and at Udskij Ostrog, unknown in Kamtschatka.*

Tringa canutus.
crassirostris.
Fulica atra.
Anas galericulata.
Ardea stellaris.
cinerea.
Tetrao bonasia.
canadensis *var.* franklinii (=*falcipennis*).
Columba risoria (accidental at the Lower Amur?).
turtur *var.* gelastis.
Milvus niger *var.* melanotis.
Strix uralensis.
passerina.
bubo.
Alcedo ispida *var.* bengalensis.
Upupa epops.
Yunx torquilla.
Picus martius.
leuconotus.
Alauda alpestris.
Corvus japonensis.
Corvus dauricus.
Garrulus glandarius.
infaustus.
Emberiza pithyornus.
rutila.
personata.
pusilla.
Fringilla spinus.
Passer montanus.
Carpodacus roseus.
Muscicapa cinereo-alba.
luteola.
Lanius phœnicurus (=***Superciliosus.***)
Certhia familiaris.
Cinclus pallasii.
Accentor alpinus.
Phyllopneuste sibirica (= *Oreopneuste fuscata*).
superciliosa.
Regulus cristatus.
Turdus naumanni.
Lusciola erythronota.

It is true that several of the species here enumerated reach their northern limit at the mouths of Amur and Uda, as for instance ***Fulica atra***, *Aix galericulata*, *Botaurus stellaris*, *Ardea cinerea*, &c., but it is not less true that the southern part of Kamtschatka is situated fully as far south as the localities mentioned, and that these very species also inhabit Northern Japan.

Still more remarkable is it that several of the species which are common inhabitants of Northern Japan, and which reach a much higher latitude on the western shore of the Okotsk Sea than the mouth of the Uda River, nevertheless characterize the Kamtschatka fauna by their absence.

It is furthermore to be remarked that these missing forms by no means belong to species of restricted distribution. A glance at the above list (Table XVI) shows that the following Circumpolar or Palæarctic genera (and subgenera, if we admit such a term), inhabiting Northern Japan and the western shore of the Okotsk Sea, are unrepresented in Kamtschatka:

TABLE XVII.

Tringa (may have been overlooked, however).
Fulica.
Botaurus.
Ardea.
Bonasa.[*]
Turtur.
Milvus.
Glaucidium.[†]
Bubo.
Otocoris (the occurrence in Japan is doubtful).
Coloeus.
Garrulus.
Perisoreus.
Spinus.
Passer.
Certhia.
Cinclus.
Accentor.
Reguloides.
Regulus.

As a supplement to the above we give the names of a few Circumpolar and Palæarctic genera (and subgenera) which occur in Northern Japan without reaching Kamtschatka, viz:

TABLE XVIII.

Podiceps (=*Tachybaptes*).
Vanellus.
Rallus.
Porzana.
Gallinula.
Ardetta.
Herodias.
Coturnix.
Circus.
Caprimulgus.
Sturnus.
Hirundo (=*Cotile*).
Troglodytes.
Pratincola.

A comparison with the following list of genera which inhabit Kamtschatka shows beyond dispute that it is not the severity of the climate that excludes most of the above genera, since they are able to stand it just as well as members of following groups, which occur there regularly:

TABLE XIX.

Colymbus.
Gallinago.
Querquedula.
Eunetta.
Spatula.
Urogallus.
Pandion.
Surnia.
Cuculus.
Micropus.
Alauda.
Nucifraga.
Pica.
Hypocentor.
Chloris.
Pyrrhula.
Loxia.
Clivicola.
Chelidon.
Lanius.
Butalis.
Erythrosterna.
Acrocephalus.
Locustella.
Ianthia.
Melodes.

---

[*] I have included such forms, the reported occurrence of which in Kamtschatka is extremely doubtful, since their occurrence on the western shore of the Okotsk Sea probably has in most cases caused the false statement of their being part of the Kamtschatkan ornis.

[†] *Ulula* is left out, since its reported occurrence in Kamtschatka is by no means improbable.

But if it is true then that Table XIX disproves the climate as the cause of the absence of representatives of the genera contained in Tables XVII and XVIII, what can be the reason of such an extraordinary phænomenon?

Evidently we have to look for an explanation in the way by which the peninsula became inhabited. Kamtschatka is one of the most typical and well defined peninsulas on the globe, and the climatological and physical conditions of the part connecting it with the continent are such as to make it a true island, zoologically speaking. Besides, there seems to be reason to assume that it has been a real island at no very distant period. The usual maps, it is true, indicate a high mountain ridge at the narrowest point of the peninsula, connecting the mountains of the latter with the orographical systems on the continent to the north. But I have heard Mr. Kennan, the celebrated traveler, who has traversed those regions in company with the Koriaks, denounce the maps as entirely wrong in that respect. He said that the country at the point in question is flat from sea to sea. From the observations I made on Bering Island, I have evidence that the latter island, at least, has been subject to a considerable rise during recent periods, and there are reasons to believe that this rise of land has taken place in the region generally. Under these suppositions the narrow neck of the peninsula has once been submerged. Looking apart from the connection to the north there is only one regular way by which Kamtschatka can have been invaded by species which do not voluntarily cross wide seas in search for new homes, and this way is by the Kuril Islands from Japan. The character of these islands, however, is such as to form a barrier rather than a highway to all species which need trees and woods as an essential condition for their existence. Besides a glance at Tables XVII and XVIII shows how surprisingly many forms have not availed themselves of extending their limits northwards over the Kurils, to which the treeless nature of these islands is no obstruction. We have seen above that some migrating birds enter Kamtschatka by some other route than from the extreme north or south, a route by which, therefore, the species in all probability have originally invaded the country, but the Table XVII is plain evidence demonstrating that it is not frequented by a great many forms which might reasonably be expected.

This fact of so many birds staying away from a country of the size, climate, and resources possessed by Kamtschatka is not satisfactorily explained by the present isolated position alone. It requires the hypothesis that this isolation has existed since it first began to be inhabited by its present land-ornis, and also that this immigration commenced at no very distant period. The probable cause of this comparatively late colonization, whether due to the country having undergone a glacial period, or whether volcanic phenomena have anything to do with it, is not in our line to discuss, these being questions for the geologists to solve.

That so many of the resident birds have developed into distinct forms is no argument against the theory of a comparatively recent colonization, since all are nearly related to forms inhabiting neighboring countries, and since this specialization is chiefly only an intensification of the general tendency of the birds inhabiting the whole region of which Kamtschatka only forms a province. If considering these facts in connection with the nearly absolute isolation of the forms in question, no assumption of a very long period seems to be needed in explanation.

The question how these residents originally happened to populate the country should, perhaps, be discussed briefly before closing these remarks.

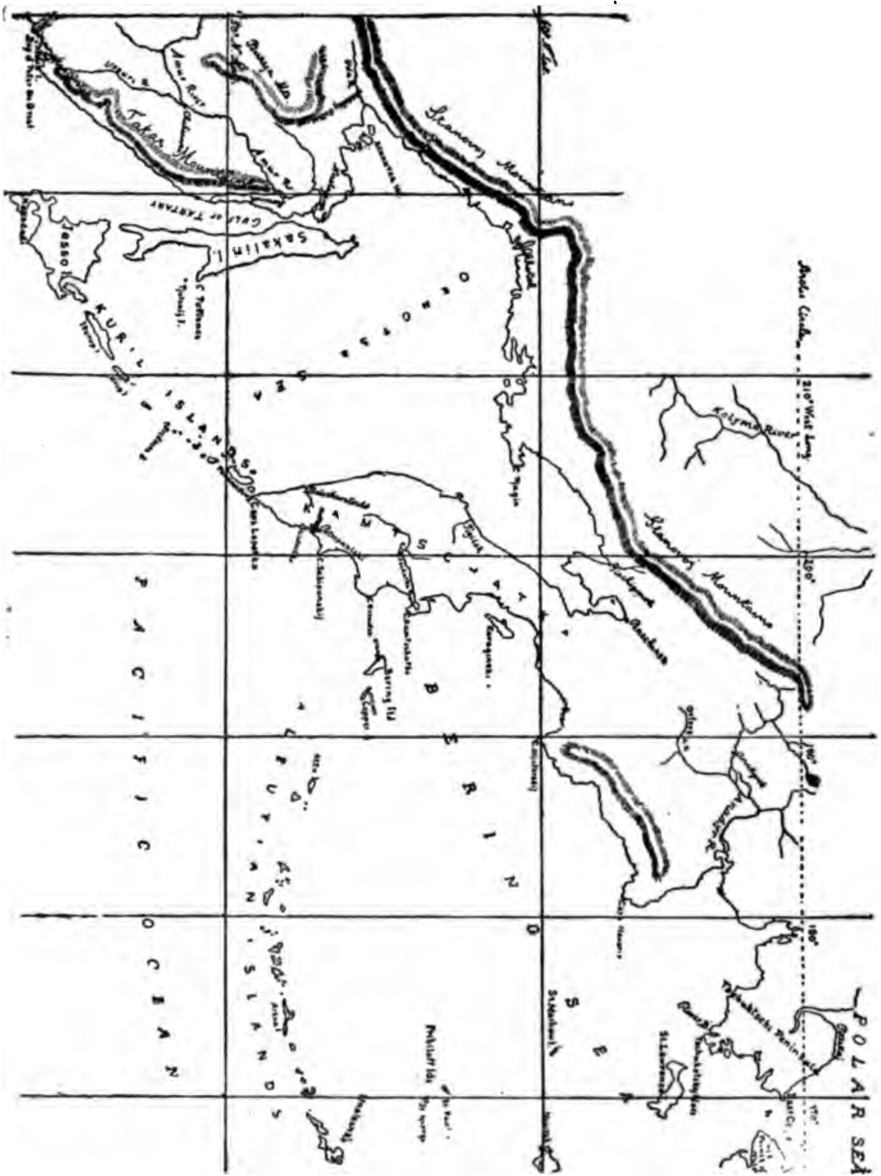
Looking at the absence of many generally distributed northern Circumpolar and Palæarctic forms of the resident ornis, for instance, *Perisoreus*, *Garrulus*, *Certhia*, *Regulus*, *Cinclus*, *Bonasa*, &c., one can hardly escape the impression that those species which now reside permanently in Kamtschatka originally came there accidentally. Like so many other islands Kamtschatka probably owes its resident ornis to storms having blown the first pairs over from countries across the sea. This population has been going on since it first became inhabitable, and continues so even to-day. That explains in a measure the different degree of abundance and specialization, those forms which have only recently made their appearance being less numerous and less modified.

Having now discussed the Kamtschatkan avifauna in its relation to the surrounding countries, the conclusion seems quite justified that the peninsula forms a very well circumscribed ornitho-geographical province, remarkable not only for a number of peculiarly modified forms, but also for a surprising absence of many of the most characteristic forms of the Northern Palæarctic and Circumpolar ornis.

It may finally be interesting to give a condensed comparison with a province of similar size and position at the opposite side of the Palæarctic continent. Great Britain is situated between nearly the same latitudes as Kamtschatka, taking a somewhat similar position on the Atlantic side as does Kamtschatka on the Pacific. Table XX is intended to show the difference between the two avifaunas. The part relating to the British birds is compiled from the recent list published by the British Ornithologists' Union, with the exclusion of all the species which are enumerated as "occasional and accidental visitors." This category has not been recognized in the Kamtschatkan list, since it is thought that their number is too small to affect the general result.

TABLE XX.

Superfamilies.	Kamtschatka.	British Islands.
Colymboideæ	2	3
Alcoideæ	17	6
Laroideæ	15	16
Procellaroideæ	5	4
Scolopacoideæ	28	29
Gruoideæ	1	5
Anatoideæ	29	27
Ardeoideæ	0	1
Phalacrocoracoideæ	2	3
Tetraonoideæ	3	8
Columboideæ	0	4
Accipitroideæ	12	14
Strigoideæ	3	4
Cuculoideæ	2	1
Alcedinoideæ	0	1
Picoideæ	3	4
Caprimulgoideæ	0	1
Micropodoideæ	1	1
Passeroideæ	52	79
	175	211



SKETCH MAP OF KAMTSCHATKA AND ADJACENT COUNTRIES.

REMARKS.—Only those mountains are represented, which are mentioned in the third part of this work.

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[All the figures are natural size unless otherwise stated.]

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FIG. 2. *Lunda cirrhata*, ♂ ad., winter. U. S. Nat. Mus. No. 92920; Bering Island, January 19, 1883.

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FIG. 1. *Lunda cirrhata*, pullus. U. S. Nat. Mus. No. 92929; Bering Island, September 6, 1883.

FIG. 2. *Lunda cirrhata*, juv. U. S. Nat. Mus. No. 92930; Bering Island, September 24, 1882.

FIG. 3. *Lunda cirrhata*, juv., winter. Bering Island, February 24, 1883.

FIG. 4. *Lunda cirrhata*, jun., winter. U. S. Nat. Mus. No. 92922; Bering Island, February 12, 1883.

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FIG. 1. *Fratercula corniculata*, ♀ ad., summer. U. S. Nat. Mus. No. 89089; Bering Island, May 21, 1882.

FIG. 2. *Fratercula corniculata*, ad., winter. Bering Island, February 24, 1883.

FIG. 3. *Fratercula corniculata*, ♂ jun., winter. U. S. Nat. Mus. No. 92932; Bering Island, February 24, 1883.

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FIG. 2. *Simorhynchus pygmæus*, ♀ ad., summer. U. S. Nat. Mus. No. 92972; Bering Island, May 6, 1883.

FIG. 3. *Simorhynchus pusillus*, ♂ ad., summer. U. S. Nat. Mus. No. 92980; Bering Island, December 30, 1882.

FIG. 4. *Simorhynchus cristatellus*, ♀ ad., summer. U. S. Nat. Mus. No. 89096; Bering Island, May 16, 1882.

FIG. 5. *Simorhynchus cristatellus*, ♀ ad., winter. U. S. Nat. Mus. No. 92958; Bering Island, March 1, 1883.

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FIG. 2. *Simorhynchus cristatellus*, ♂ ad., summer. U. S. Nat. Mus. No. 92954; Bering Island, June 4, 1883. Mouth opened to show the outline of the rictus.

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- FIG. 2. *Fulmarus glacialis glupischa*, ad., dark phase, summer. U. S. Nat. Mus. No. 92910; Bering Island, May 4, 1883.
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- FIG. 1. *Anser segetum middendorffi*, ♂ ad. U. S. Nat. Mus. No. 92824; Bering Island, May 10, 1883.
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- FIG. 3. *Somateria v-nigra*, ♂ ad. U. S. Nat. Mus. No. 92848; Copper Island, July 3, 1883.

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* Having since discovered that *Hirundo cinerea* is preocupied by Latham in 1790 for another species, I propose to call the American variety *Clivicola riparia maximiliani*, Prince Max von Wied being the first author to destinguish it. I may add that this form has proportionately larger feet than the European race, while, on the other hand, the latter has a longer wing than its American representative.

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* Dall's specimen is No. 41040, U. S. Nat. Mus., Petropaulski, Aug. 20. An examination shows that it in no way differs from Scandinavian examples.

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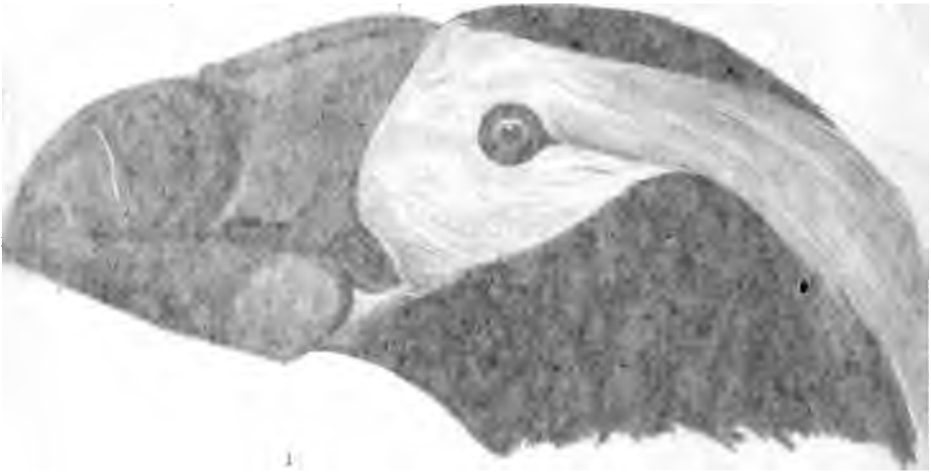
PLATE I.

[Bulletin No. 29, United States National Museum.]

FIG. 1. *Lunda cirrhata*, ♀ ad., summer. U. S. Nat. Mus. No. 89087; Bering Island, May 11, 1882.

FIG. 2. *Lunda cirrhata*, ♂ ad., winter. U. S. Nat. Mus. No. 92920; Bering Island, January 19, 1883.



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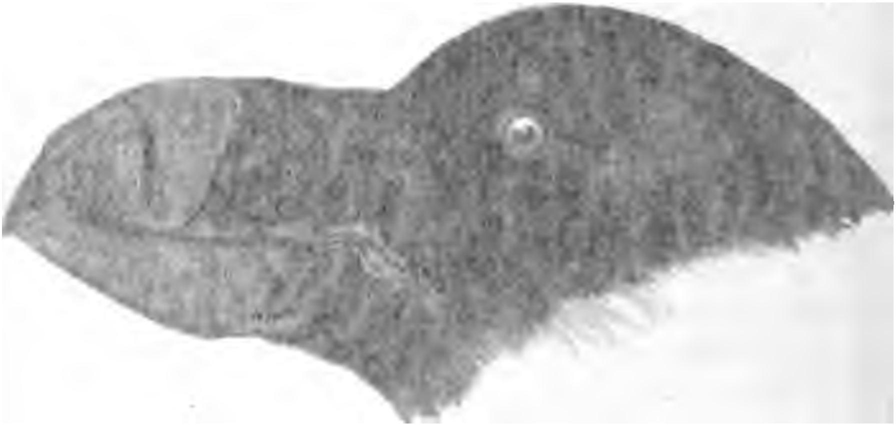

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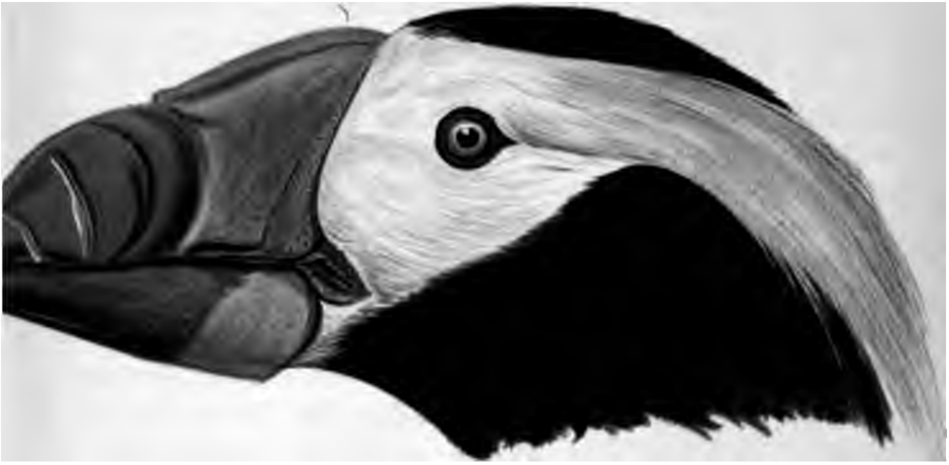

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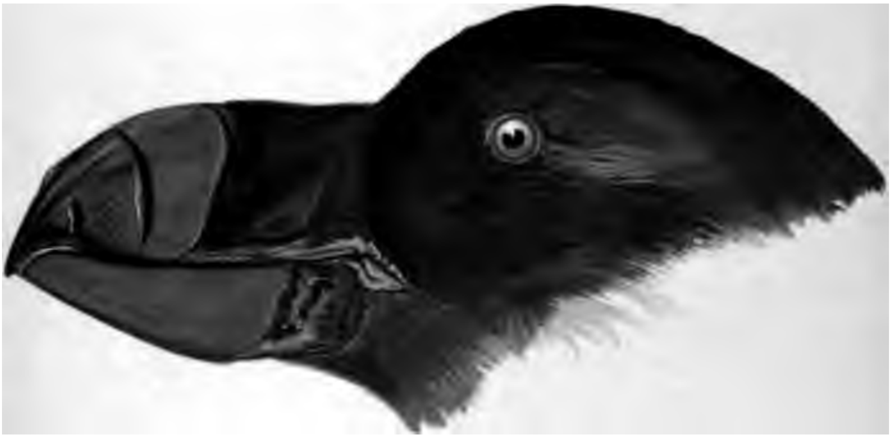

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PLATE II.

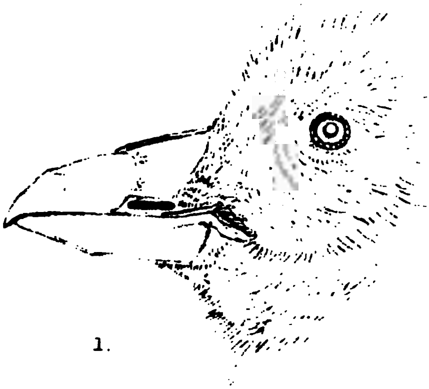
[Bulletin No. 29, United States National Museum.]

FIG. 1. *Lunda cirrhata*, pullus. U. S. Nat. Mus. No. 92929; Bering Island, September 6, 1883.

FIG. 2. *Lunda cirrhata*, juv. U. S. Nat. Mus. No. 92930; Bering Island, September 24, 1882.

FIG. 3. *Lunda cirrhata*, juv., winter. Bering Island, February 24, 1883.

FIG. 4. *Lunda cirrhata*, jun., winter. U. S. Nat. Mus. No. 92922; Bering Island, February 12, 1883.



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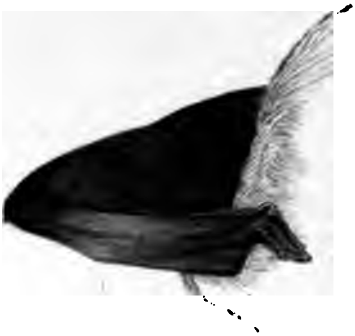

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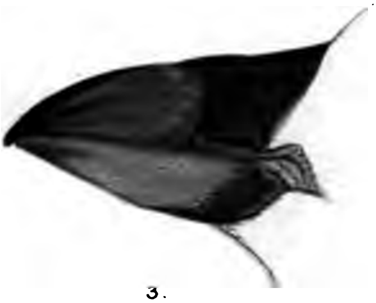

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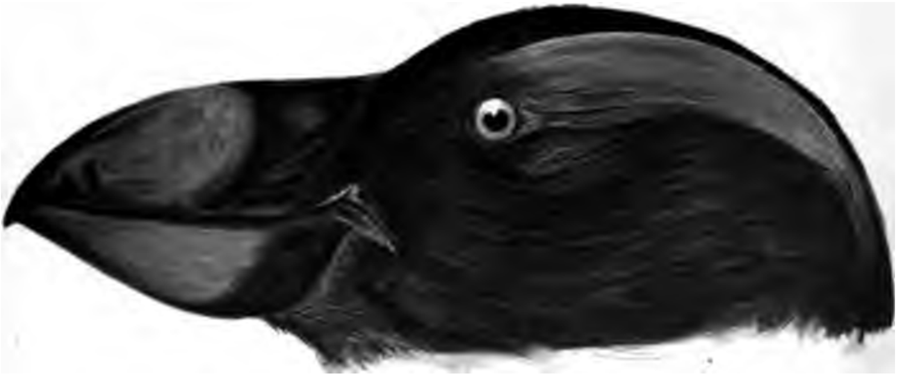

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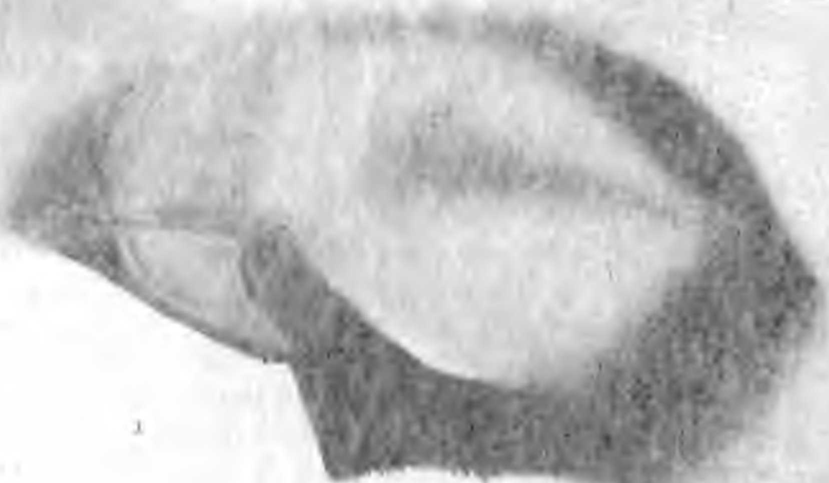
PLATE III.

[Bulletin No. 29, United States National Museum.]

FIG. 1. *Fratercula corniculata*, ♀ ad., summer. U. S. Nat. Mus. No. 89089; Bering Island, May 21, 1882.

FIG. 2. *Fratercula corniculata*, ad., winter. Bering Island, February 24, 1883.

FIG. 3. *Fratercula corniculata*, ♂ jun., winter. U. S. Nat. Mus. No. 92932; Bering Island, February 24, 1883.



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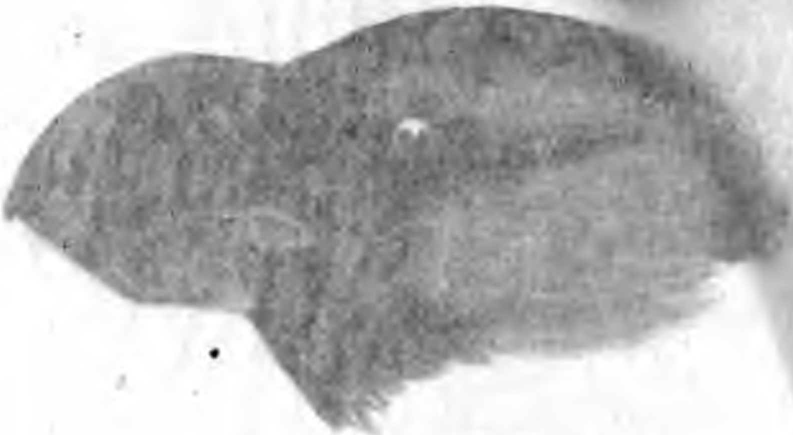

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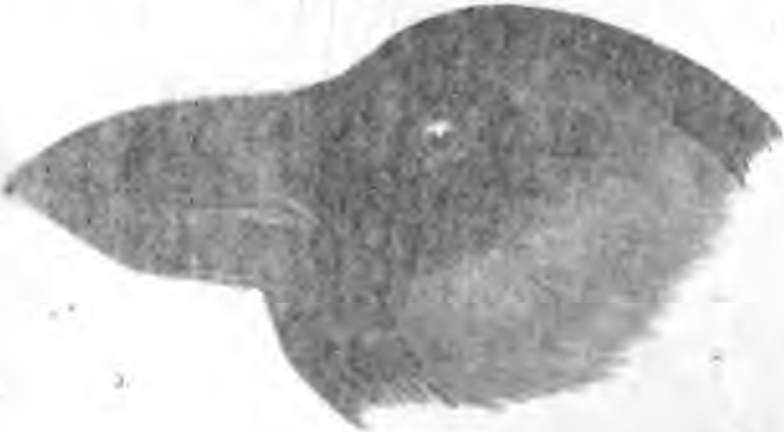

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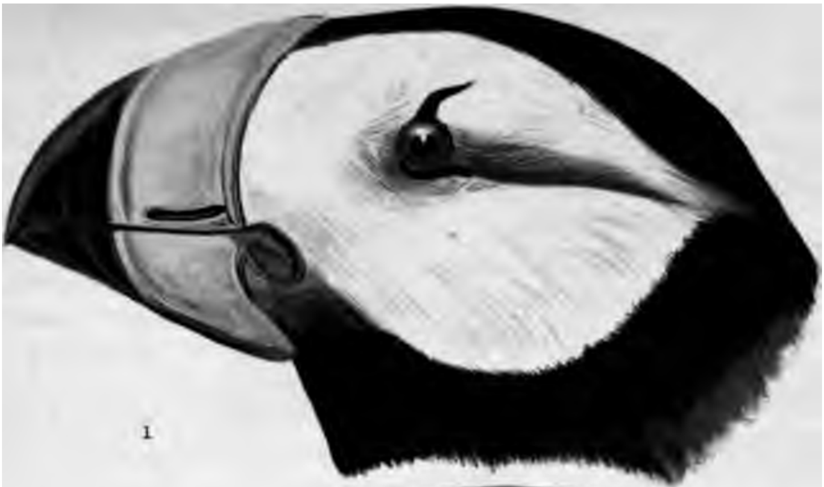

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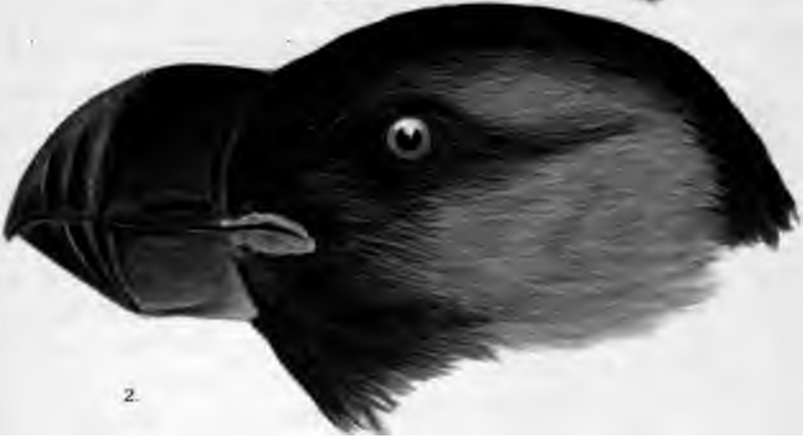

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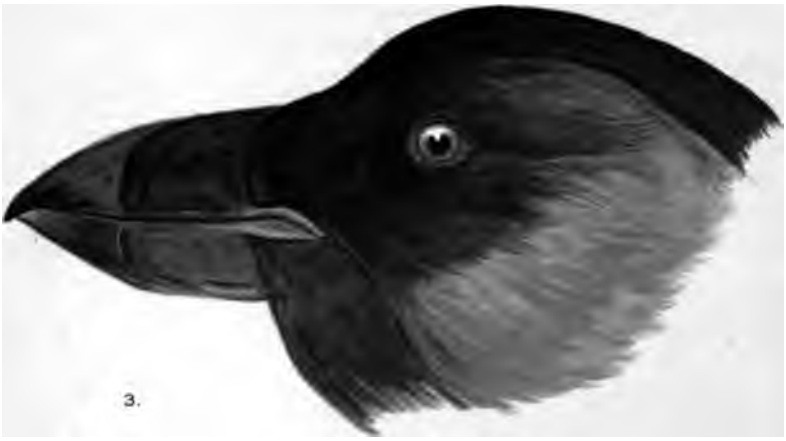

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PLATE IV.

[Bulletin No. 29, United States National Museum.]

FIG. 1. *Simorhynchus pygmæus*, ♂ ad., winter. U. S. Nat. Mus. No. 92960; Bering Island, December 29, 1882.

FIG. 2. *Simorhynchus pygmæus*, ♀ ad., summer. U. S. Nat. Mus. No. 92972; Bering Island, May 6, 1883.

FIG. 3. *Simorhynchus pusillus*, ♂ ad., summer. U. S. Nat. Mus. No. 92980; Bering Island, December 30, 1882.

FIG. 4. *Simorhynchus cristatellus*, ♀ ad., summer. U. S. Nat. Mus. No. 89096; Bering Island, May 16, 1882.

FIG. 5. *Simorhynchus cristatellus*, ♀ ad., winter. U. S. Nat. Mus. No. 92958; Bering Island, March 1, 1883.

FIG. 6. *Cyclorrhynchus psittaculus*, ♀ ad., summer. U. S. Nat. Mus. No. 92946; Bering Island, May 9, 1883.

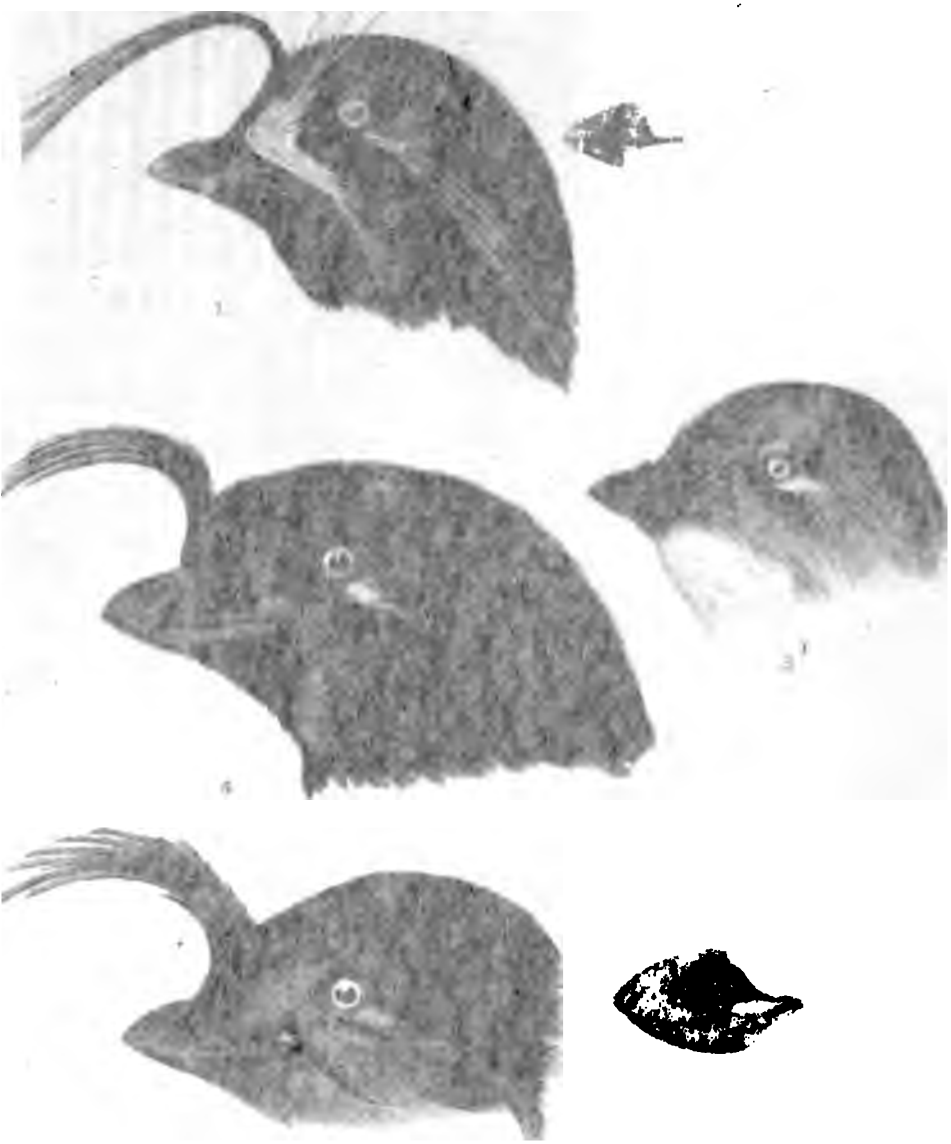
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PLATE IV.

[Bulletin No. 29, United States National Museum.]

Fig. 1. *Simorhynchus pygmaeus*, ♂ ad., winter. U. S. Nat. Mus. No. [illegible] [illegible] Island, December 2[illegible], 18[illegible].

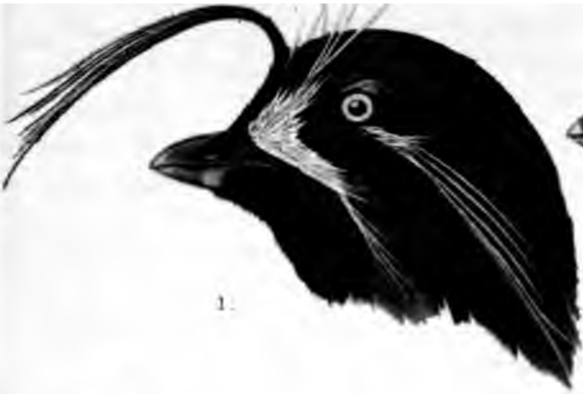
Fig. 2. *Simorhynchus pygmaeus*, ♂ ad., summer. U. S. Nat. Mus. No. [illegible] [illegible] Island, May [illegible], 1883.

Fig. 3. *Simorhynchus pusillus*, ♀ ad., summer. U. S. Nat. Mus. No. [illegible] [illegible] Island, December 30, 18[illegible].

Fig. 4. *Simorhynchus cristatellus*, ♀ ad., summer. U. S. Nat. Mus. No. [illegible] [illegible] Island, May [illegible], 1882.

Fig. 5. *Simorhynchus cristatellus*, ♀ ad., winter. U. S. Nat. Mus. No. [illegible] [illegible] Island, March 1, 1883.

Fig. 6. *Cyclorrhynchus psittaculus*, ♀ ad., summer. U. S. Nat. Mus. No. [illegible] [illegible] Island, May 9, 1883.



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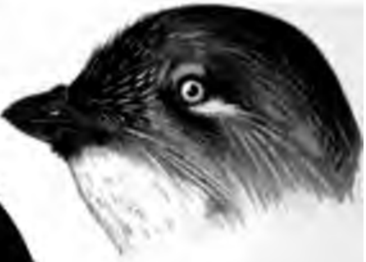

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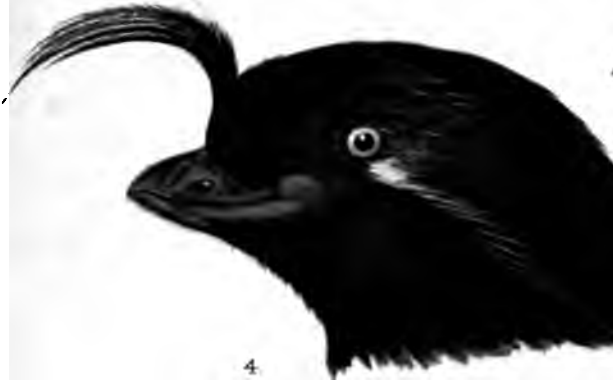

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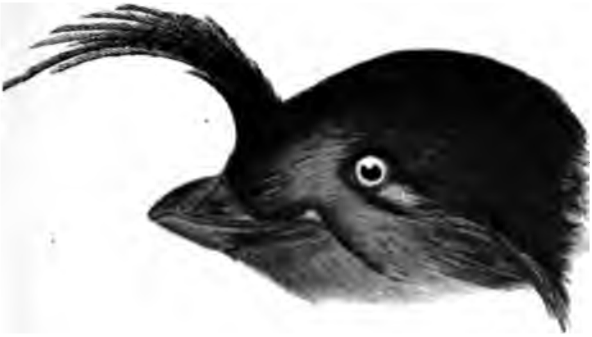

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PLATE V.

[Bulletin No. 29, United States National Museum.]

FIG. 1. *Cyclorrhynchus psittaculus*, ♀ ad., summer. U. S. Nat. Mus. No. 89095; Bering Island, July 11, 1882. For explanation of letters see p. 41.

FIG. 2. *Simorhynchus cristatellus*, ♂ ad., summer. U. S. Nat. Mus. No. 92954; Bering Island, June 4, 1883. Mouth opened to show the outline of the rictus.

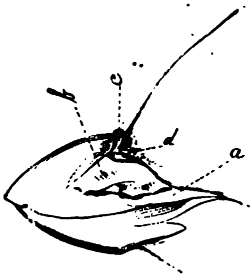
FIG. 3. *Simorhynchus pygmæus*, ♂ ad., winter. U. S. Nat. Mus. No. 92960; Bering Island, December 29, 1882. Head seen from behind to show the position of the lateral crests.

FIG. 4. *Simorhynchus pygmæus*, ♂ ad., winter. U. S. Nat. Mus. No. 92970; Bering Island, January 16, 1883. Mouth open for comparison with Fig 2.

FIG. 5. *Simorhynchus pusillus*, ♂ ad., winter. U. S. Nat. Mus. No. 92980; Bering Island, December 30, 1882. Bill from above.

FIG. 6. *Synthliboramphus antiquus*, ♂ ad. U. S. Nat. Mus. No. 92985; Bering Island, January 3, 1883.

FIG. 7. Same specimen. Bill from above.



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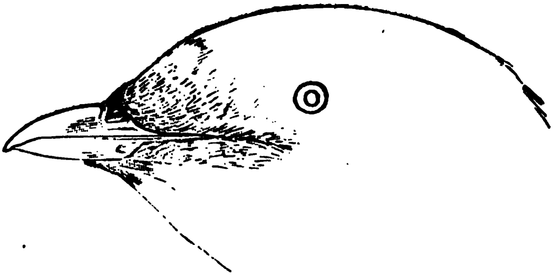

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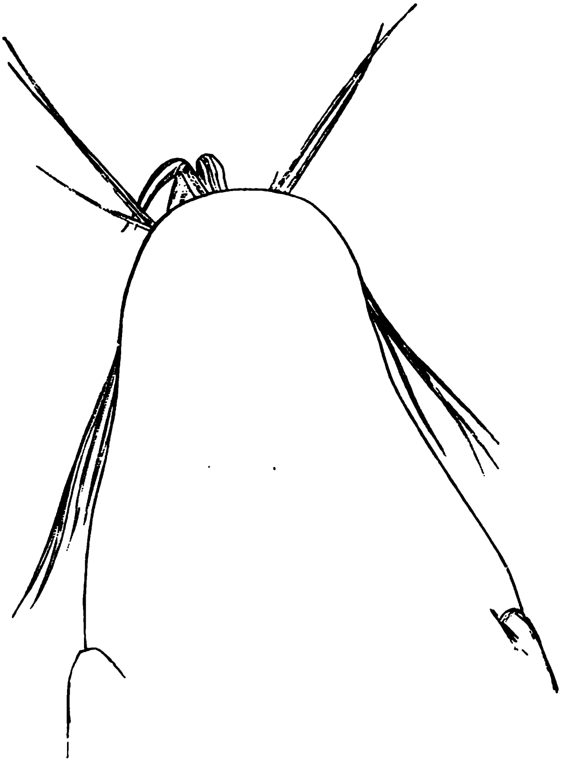

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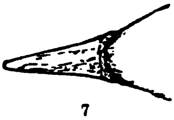

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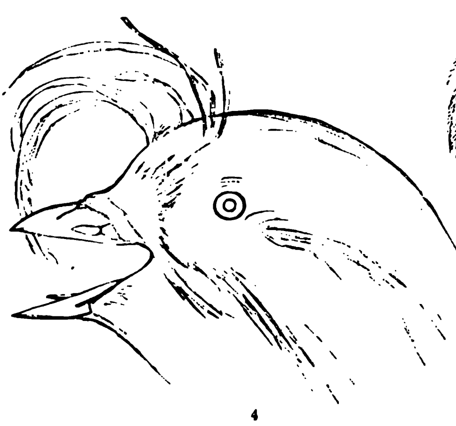

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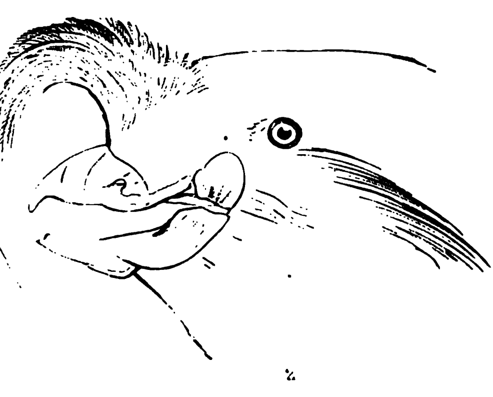

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PLATE VI.

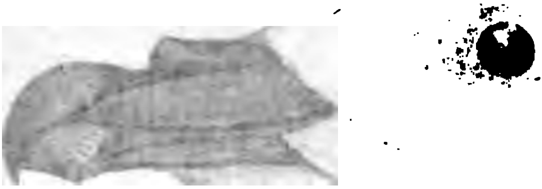
[Bulletin No. 29, United States National Museum.]

FIG. 1. ***Fulmarus glacialis glupischa***, ♂ ad., white phase, winter. U. S. Nat. Mus. No. 92908; Bering Island, February 7, 1883.

FIG. 2. ***Fulmarus glacialis glupischa***, ad., dark phase, summer. U. S. Nat. Mus. No. 92910; Bering Island, May 4, 1883.

FIG. 3. ***Larus schistisagus***, ♂ ad. U. S. Nat. Mus. No. 92885; Bering Island, May 5, 1883.

FIG. 4. ***Larus kamtschatchensis***, ♂ ad. U. S. Nat. Mus. No. 92889; Bering Island, May 21, 1883.



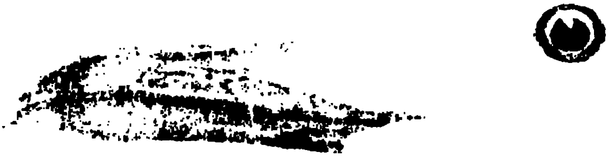


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Fig. 2. [illegible]
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Fig. 3. [illegible]
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Fig. 4. [illegible] No. 92980; Bering Island. [illegible]
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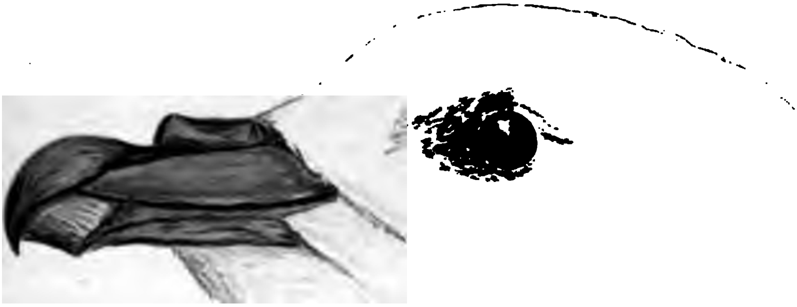

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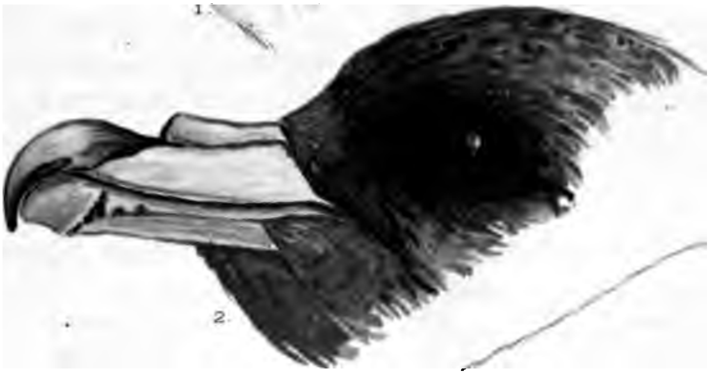

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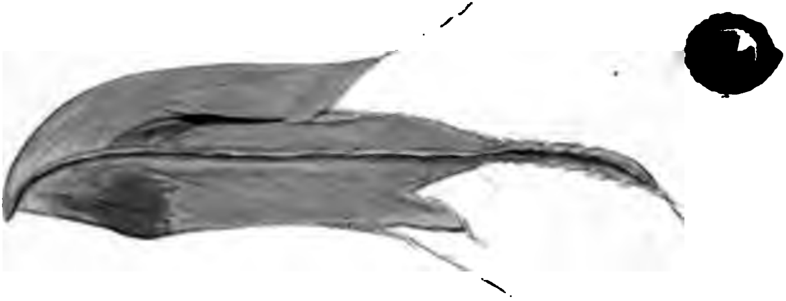

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PLATE VII.

[Bulletin No. 29, United States National Museum.]

FIG. 1. *Anser segetum middendorffi*, ♂ ad. U. S. Nat. Mus. No. 92824; Bering Island May 10, 1883.

FIG. 2. *Anser albifrons gambeli*, ♀ ad. U. S. Nat. Mus. No. 92826; Bering Island, May 10, 1883.

FIG. 3. *Somateria v-nigra*, ♂ ad. U. S. Nat. Mus. No. 92848; Copper Island, July 3, 1883.

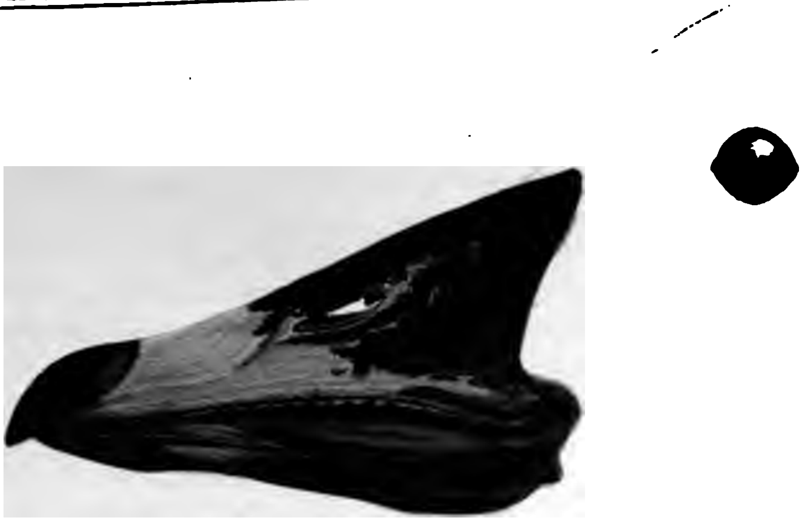
PLATE VII.

[Bulletin No. [illegible] United States National Museum.]

Fig. 1. *Anser segetum middendorffi*. ♂ ad. U. S. Nat. Mus. No. [illegible]; [illegible] [illegible], 1883.

Fig. 2. *Anser albifrons gambeli*. ♀ ad. U. S. Nat. Mus. No. [illegible]; [illegible] [illegible], 188[illegible].

Fig. 3. *Somateria v-nigra*. ♂ ad. U. S. Nat. Mus. No. [illegible]; Cooper's [illegible] J[illegible]



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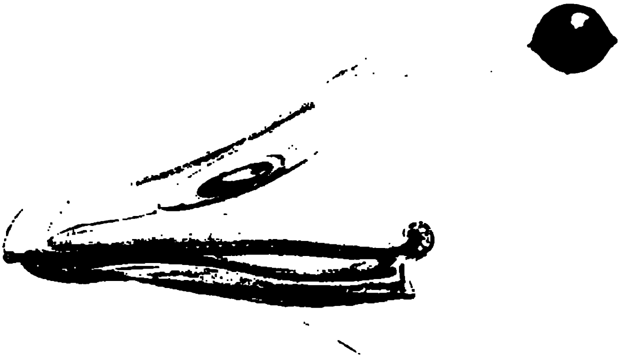

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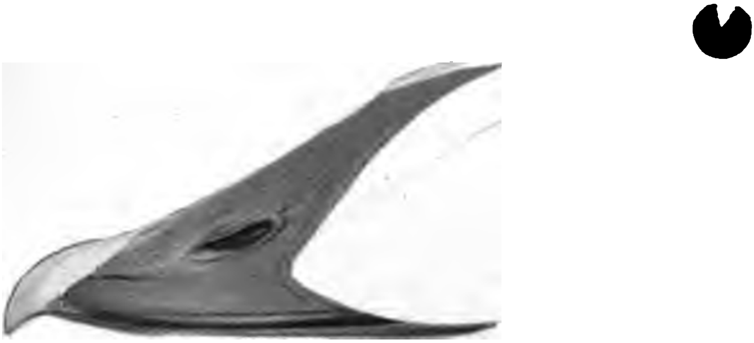

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PLATE VIII.

[Bulletin No. 29, United States National Museum.]

FIG. 1. *Phalacrocorax pelagicus*, ♀ ad. U. S. Nat. Mus. No. 92833; Bering Island, April 26, 1883.

FIG. 2. *Phalacrocorax urile*, ♂ ad. U. S. Nat. Mus. No. 92877; Copper Island, July 14, 1883.

FIG. 3. *Phalacrocorax urile*, juv. U. S. Nat. Mus. No. 92878; Copper Island, July 25, 1883.

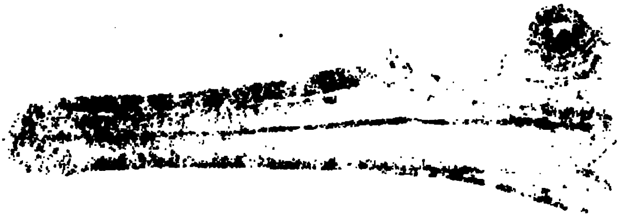


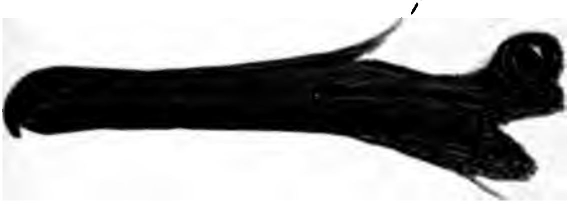
PLATE VII.

(Bulletin No. [illegible] United States National Museum.)

1. [illegible] *pelagicus*, [illegible] U. S. Nat. Mus. No. [illegible] Island [illegible]

2. [illegible] *gracile*, ♂ [illegible] U. S. Nat. Mus. No. [illegible]

3. *Phalacrocorax gracile*, juv. U. S. Nat. Mus. No. [illegible] 1883.



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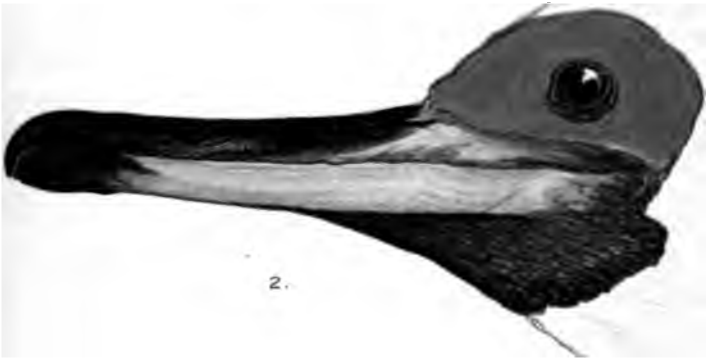

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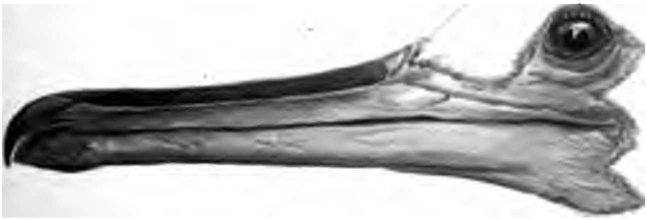

3.

L. Stejneger, ad nat pinx

Julius Bi

Department of the Interior:

U. S. NATIONAL MUSEUM.

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 30.

BIBLIOGRAPHIES OF AMERICAN NATURALISTS.—
III. PUBLICATIONS RELATING TO FOSSIL INVERTEBRATES.

BY

JOHN BELKNAP MARCOU.

◆

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1885.

Department of the Interior:

U. S. NATIONAL MUSEUM.

— Serial Number 40 —

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 30.

PUBLISHED UNDER THE DIRECTION OF THE SMITHSONIAN INSTITUTION.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1885.

ADVERTISEMENT.

This work (Bulletin No. 30) is the fortieth of a series of papers intended to illustrate the collections of natural history and ethnology belonging to the United States, and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846. It constitutes the third of the series of bibliographies illustrating the work of the Museum.

It has been prepared at the request of the Institution, and printed by authority of the honorable Secretary of the Interior.

The publications of the National Museum consist of two series—the Bulletins, of which this is No. 30, in continuous series, and the Proceedings, of which the eighth volume is now in press.

The volumes of Proceedings are printed signature by signature, each issue having its own date, and a small edition of each signature is distributed to libraries promptly after its publication.

From time to time the publications of the Museum which have been issued separately are combined together and issued as volumes of the Miscellaneous Collections. These are struck off from the stereotype plates from which the first edition was printed, and in this form are distributed by the Smithsonian Institution to libraries and scientific societies throughout the world. Volume 13 of these collections includes Bulletins 1 to 10, inclusive; volume 19, volumes 1 and 2 of the Proceedings; volume 22, volumes 3 and 4 of the Proceedings; and volume 23, Bulletins 11 to 15, inclusive.

Full lists of the publications of the Museum may be found in the current catalogues of the publications of the Smithsonian Institution.

SPENCER F. BAIRD,
Secretary of the Smithsonian Institution.

SMITHSONIAN INSTITUTION,
Washington, December 1, 1885.

BIBLIOGRAPHIES OF AMERICAN NATURALISTS.

III.

BIBLIOGRAPHY OF PUBLICATIONS

RELATING TO

THE COLLECTION OF FOSSIL INVERTEBRATES

IN THE

UNITED STATES NATIONAL MUSEUM,

INCLUDING

COMPLETE LISTS OF THE WRITINGS OF FIELDING B. MEEK,
CHARLES A. WHITE, AND CHARLES D. WALCOTT.

BY

JOHN BELKNAP MARCOU.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1885.

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INTRODUCTORY NOTE.

In preparing the following catalogues chronologic order has been followed under the different authors, and in Part IV the fifteen different authors are arranged, first, alphabetically and then chronologically under each author. Correctness of bibliographic form and detail has not been so much sought after as completeness and accuracy in the numerous references. A general alphabetic index of species will be found at the end of the volume. The compiler will be glad to have his attention called to any errors or omissions. Dr. White's bibliography is prepared from data furnished by himself. I am much indebted to Dr. White for his kind advice and help in the preparation of the work.

PART I.

THE PUBLISHED WRITINGS OF FIELDING BRADFORD MEEK.

1.—THE PUBLISHED WRITINGS OF FIELDING BRADFORD MEEK.

BIOGRAPHIC SKETCH OF FIELDING BRADFORD MEEK.*

On December 10, 1817, Fielding Bradford Meek was born in the city of Madison, Ind. His grandparents were Irish Presbyterians, who removed from Armagh County to America about 1768, and who finally settled in Hamilton County, Ohio. His father, together with his family, removed from there to Madison, where he was a lawyer of considerable eminence. The family, including those born in Madison, consisted of the parents, two sons and two daughters besides Fielding, all of whom died several years before him. The father died when the son who was to become so distinguished a paleontologist was only three years old, leaving the family in moderate circumstances. Mr. Meek's early youth was passed in Madison. His education was much impeded by the delicate condition of his health. Upon reaching manhood, by advice of his friends and against his own inclination, for he was of a studious and retiring disposition, he invested his small patrimony in mercantile business, first in his native place, and afterward in Owensborough, Ky. The result was financial failure and loss of all he possessed. After this, while laboring for his support and struggling with ill health and poverty, he continued his studies, general and special, for he began early to devote himself to natural history. His first public work was during the years 1848 and 1849, and was performed, as an assistant of Dr. D. D. Owen, upon the United States geological survey of Iowa, Wisconsin, and Minnesota.

Having closed this work, he returned to his home in Owensborough, but soon after, in the year 1852, went to Albany, N. Y., as assistant to Professor Hall, in the paleontologic work of that State. He remained there until 1858, serving three summers. Two of these summers were spent on the geologic survey of Missouri; the other, that of 1853, was employed in exploring the Bad Lands of Nebraska, together with Dr. F. V. Hayden, both being commissioned by Professor Hall for that work. Three years after this exploration, he prepared for publication, in conjunction with Professor Hall, an important memoir on cretaceous fossils from Nebraska. In 1858, Mr. Meek left Albany and took up his residence in Washington, where he continued to live until his death. His home, and the place of his scientific work, except when in the field, was at the Smithsonian Institution, and it was within its walls that the greatest part of his scientific work was accomplished. The association which he formed with Dr. Hayden in 1853 was tacitly continued until Mr. Meek's death. When Dr. Hayden commenced his explorations in the Western Territories, and afterwards organized the Geological Survey of the Rocky Mountain region, Mr. Meek was entrusted with all the invertebrate paleontology, much of which appeared under their joint names. It was the custom of Mr. Meek to publish preliminary descriptions of his new species, and afterward elaborate and illustrate the subjects for final publication. Thoroughness, scrupulous exactness, and nice powers of discrimination are manifested in all his labors; and with such merits his works will shed luster upon his name as long as paleontology is studied. No one in America has done more than he to systematize and advance the science to which he devoted his life. His personal character cannot be too highly eulogized, for it was without a blemish. He was a genial, sincere, pure-minded, honorable man. Gentleness and candor were apparent in every expression of his face, and in every word he uttered; but he was self-reliant and ready at all times to defend what he believed to be right, and with his keen sense of justice, he was seldom mistaken as to what was right. He was never in vigorous health and often ill; but never complaining, always hopeful, always cheerful, always at the work he loved so well, always helpful of others. His hearing began to fail in early manhood, and the affliction increased until he became entirely deaf several years before he died. Even when cut off from conversation with his fellow-men his cheerfulness did not forsake him; but he seemed to derive great pleasure from written communication with his friends. He was never married, and leaves no near relatives; but all with whom he was ever brought in contact will remember him with pleasure, while to those who were permitted to enjoy scientific intercourse or correspondence with him during his life, his memory will be especially dear. He died at Washington, D. C., on the 21st of December, 1876, having only a few days before completed his 59th year. He had been in ill health for several years past, and indeed almost all his life, for his malady was inherited *phthisis pulmonalis*. It had been his custom for several years to spend the winter in Florida, and the summer months in the Alleghany Mountains. He had made preparations to leave Washington for Florida early in December, but was taken with hemorrhage of the lungs on the day before the one set for his departure. He never rallied from this attack, but gradually sank to a peaceful and quiet death.

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* This sketch is compiled from data taken down at Mr. Meek's dictation by a friend shortly before his death.

1.

MEEK, F. B. Mr. Meek's report on Moniteau County. <The first and second annual reports of the geological survey of Missouri, by G. C. Swallow, State geologist. Part II. pp. 96–117. Jefferson City, 1855.

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Mr. Meek also drew the figures illustrating the paleontological report in this volume. A geological map of the county is also given.

2.

HALL, JAMES, *and* MEEK, F. B Descriptions of new species of fossils from the Cretaceous formations of Nebraska; with observations upon Baculites ovatus and B. compressus, and the progressive development of the septa in Baculites, Ammonites, and Scaphites. <Mem. Am. Acad. Arts and Sci., vol. v, new ser., pp. 379–411, 8 plates. 1856. Cambridge, 1856.

The fossils described in this paper were collected in 1853 by F. B. Meek and F. V. Hayden. The paper was communicated June 27, 1854, but was not published till 1856.

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Fusus constrictus is referred to the genus *Buccinum*.

Hamites mortoni is regarded as belonging to the genus *Ancyloceras* as defined by Pictet.

3.

Meek, F. B., *and* **Hayden, F. V.** Descriptions of new species of Gasteropoda, from the Cretaceous formation of Nebraska Territory. <Proc. Acad. Nat. Sci. Phila., vol. viii, pp. 63–69. 1856. Philadelphia, 1857.

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Meek, F. B., *and* **Hayden, F. V.** Descriptions of new species of Gasteropoda and Cephalopoda, from the Cretaceous formations of Nebraska Territory. <Proc. Acad. Nat. Sci. Phila., vol. viii, pp. 70–72. 1856. Philadelphia, 1857.

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5.

Meek, F. B., *and* **Hayden, F. V.** Descriptions of twenty-eight new species of Acephala and one Gasteropod, from the Cretaceous formations of Nebraska Territory. <Proc. Acad. Nat. Sci. Phila., vol. viii, pp. 81–87. 1856. Philadelphia, 1857.

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6.

Meek, F. B., *and* **Hayden, F. V.** Descriptions of new species of Acephala and Gasteropoda, from the Tertiary formations of Nebraska Territory; with some general remarks on the geology of the country about the sources of the Missouri River. <Proc. Acad. Nat. Sci. Phila., vol. viii, pp. 111–126. 1856. Philadelphia, 1857.

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On page 126 *Pyrula bairdi* is changed to Busycon (Bolten), and called *B. bairdi*.

7.

MEEK, F. B., *and* HAYDEN, F. V. Descriptious of new fossil species of Mollusca collected by Dr. F. V. Hayden in Nebraska Territory, together with a complete catalogue of all the remains of Invertebrata hitherto described and identified from the Cretaceous and Tertiary formations of that region. <Proc. Acad. Nat. Sci. Phila., vol. viii, pp. 265–286. 1856. Philadelphia, 1857.

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8.

Meek, F. B. Description of new organic remains from the Cretaceous rocks of Vancouver's Island. <Trans. Albany Inst., vol. iv, pp. 37-49. 1857. Albany, 1858-1864.

The fossils here described were collected by Dr. J. S. Newberry, geologist of Lieutenant Williamson's North California and Oregon Exploring Expedition. The author describes twelve new species.

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Mr. Meek gives the date of these species as 1857 when he republished them with illustrations in the Bull. U. S. Geol. and Geogr. Surv. Terr., vol. ii, No. 4. Washington, 1876.

9.

Meek, F. B., *and* **Hayden**, F. V. Descriptions of new species and genera of fossils collected by Dr. F. V. Hayden in Nebraska Territory, under the direction of Lieut. G. K. Warren, U. S. Topographical Engineers; with some remarks on the Tertiary and Cretaceous formations of the Northwest and the parallelism of the latter with those of other portions of the United States and Territories. <Proc. Acad. Nat. Sci. Phila., 1st series, vol. ix, pp. 117-148. 1857. Philadelphia, 1858.

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10.

MEEK, F. B., *and* HAYDEN, F. V. Fossils of Nebraska. Letter from F. B. Meek and F. V. Hayden to G. K. Warren, Lieut. Topog. Eng., dated Washington February 8, 1858; printed in the National Intelligencer of March 16. <Am. Journ. Sci., vol. xxv, 2d ser., pp. 439–442. New Haven, 1858.

This article is mainly geologic, only the genera, which characterize the formations under discussion, being enumerated.

11.

MEEK, F. B., *and* HAYDEN, F. V. Descriptions of new organic remains collected in Nebraska Territory, in the year 1857, by Dr. F. V. Hayden, geologist to the exploring expedition under the command of Lieut. G. K. Warren, Top. Eng., U. S. Army; together with some remarks on the geology of the Black Hills and portions of the surrounding country. <Proc. Acad. Nat. Sci. Phila., vol. x, pp. 41–59. 1858. Philadelphia, 1859.

Jurassic fossils. Afterward republished and illustrated, in 1865, in Paleontology of the Upper Missouri, Smithsonian Contributions to Knowledge, 172.

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12.

Meek, F. B., *and* **Hayden, F. V.** Remarks on the Lower Cretaceous beds of Kansas and Nebraska, together with descriptions of Carboniferous fossils from the valley of Kansas River. <Proc. Acad. Nat. Sci. Phila., vol. x, pp. 256–264. 1858. Philadelphia, 1859.

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Meek, F. B., *and* **Hayden, F. V.** Descriptions of new organic remains from North-eastern Kansas, indicating the existence of Permian rocks in that territory. <Trans. Albany Institute, vol. iv, pp. 73–88. 1858. Albany, 1858–1864.

This includes a note in relation to the priority of discovery of these fossils of Permian type.

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Meek, F. B., *and* **Hayden, F. V.** Geological explorations in Kansas Territory. <Proc. Acad. Nat. Sci. Phila., vol. xi, pp. 8–30. 1859. Philadelphia, 1860.

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Cladodus occidentalis, Leidy	30
Petalodus alleghaniensis, Leidy	30

15.

MEEK, F. B., *and* HAYDEN, F. V. On a new genus of Patelliform shells from the Cretaceous rocks of Nebraska. <Am. Journ. Sci., vol. xxix, 2d ser., pp. 33–35, plate i. 1860. New Haven, 1860.

Genus Anisomyon,* n. g., M. & H., 1860.

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Anisomyon patelliformis, M. & H., pl. i, figs. 1–3	34–35

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*Ἄνισος, unequal; μυών, muscle; in allusion to the unsymmetrical muscular scar.

The authors refer the following Nebraska species to this genus:

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Anisomyon alveolus (=*Helcium alveolum*, M. & H.)	35
Anisomyon patelliformis (=*Helcium patelliforme*, M. & H.)	35
Anisomyon subovatus (=*Helcium subovatum*, M. & H.)	35

16.

Meek, F. B., *and* Hayden, F. V. Descriptions of new organic remains from the Tertiary, Cretaceous, and Jurassic rocks of Nebraska. <Proc. Acad. Nat. Sci. Phila., vol. xii, pp. 175-184. 1860. Philadelphia, 1861.

A description of the Carboniferous species *Myalina aviculoides* is also added; also a corrected list of fossils.

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Inoceramus subcompressus, n. s., M. & H., 1860	181
Inoceramus aviculoid[*e*]*s*, n. s., M. & H., 1860	181
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17.

Meek, F. B. Descriptions of new fossil remains collected in Nebraska and Utah by the exploring expeditions under the command of Capt. J. H. Simpson, of the U. S. topographical engineers (extracted from that officer's forthcoming report). <Proc. Acad. Nat. Sci. Phila., vol. xii, pp. 308–315. 1860. Philadelphia, 1861.

Devonian, Carboniferous, Jurassic, Cretaceous, and Tertiary. Republished with illustrations in a quarto volume of Captain Simpson's Reports, in 1876.

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Gasteropoda	313
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Melampus priscus, n. s., Meek, 1860	315

18.

Meek, F. B., *and* **Hayden**, F. V. Systematic catalogue with synonymy, &c., of Jurassic, Cretaceous, and Tertiary fossils, collected in Nebraska by the exploring expeditions under the command of Lieut. G. K. Warren, of U. S. Topographical Engineers. <Proc. Acad. Nat. Sci. Phila., vol. xii, pp. 417–432. 1860. Philadelphia, 1861.

Of the 276 species and varieties enumerated in the following catalogue, 25 are from Jurassic rocks, 194 from Cretaceous, and the remaining 57 from Tertiary strata.

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19.

Meek, F. B., *and* **Worthen**, A. H. Descriptions of new species of Crinoidea and Echinoidea, from the Carboniferous rocks of Illinois and other western States. <Proc. Acad. Nat. Sci. Phila., vol. xii, pp. 379–397. 1860. Philadelphia, 1861.

Afterward republished in the Illinois Geological Reports, vol. ii.

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* Σφήν, a wedge; ποτήριον, a cup.

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The authors conclude it to be probably of Carboniferous age, and, at any rate, much more recent than the Chemung, and not equivalent to any New York rock.

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* ὀλίγος, few; and πόρος, opening a pore.

22.

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* Cardium and οψις, from its resemblance to Cardium.

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Corrections in regard to a few fossils described in papers of September and October, 1860.

Cyathocrinus scitulus (September, 1860) should be *C. sculptilus*.

Platyostoma nana (October, 1860) should be *Naticopsis*.

Eulima peracuta (October, 1860) should be ranged under *Polyphemopsis*, of Portlock, probably a section of the genus *Loxonema*.

Orthoceras expansum (October, 1860) belongs to the genus or subgenus *Actinoceras*.

Cyrtoceras curtum (October, 1860) should be ranged under the subgenus *Aploceras*.

23.

Meek, F. B. Descriptions of new Cretaceous fossils collected by the Northwestern Boundary Commission on Vancouver and Sucia Islands. <Proc. Acad. Nat. Sci. Phila., vol. xiii, pp. 314-318. 1861. Philadelphia, 1862.

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24.

Meek, F. B., *and* **Hayden, F. V.** Descriptions of new Lower Silurian (Primordial), Jurassic, Cretaceous, and Tertiary fossils, collected in Nebraska by the exploring expedition under the command of Capt. Wm. F. Raynolds, U. S. Top. Engrs., with some remarks on the rocks from which they were obtained. <Proc. Acad. Nat. Sci. Phila., vol. xiii, pp. 415-447. 1861. Philadelphia, 1862.

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† ορθος, straight; νημα, thread.

‡ τρῆμα and δισκος, in allusion to the perforated umbilicus and the discoid form of the shell in the typical species.

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26.

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27.

MEEK, F. B. Remarks on the family Pterriidæ (=Aviculidæ), with descriptions of some new fossil genera. <Am. Journ. Sci., vol. xxxvii, 2d ser., pp. 212–220. 1864. New Haven, 1864.

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28.

MEEK, F. B. Carboniferous and Jurassic fossils. <Paleontology of California (Whitney), vol. i, pp. 1–16, 2 plates, and pp. 39–53, pls. vii and viii. 1864. Published by authority of the legislature of California, 1844.

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Primordial, Carboniferous, Permian, and Jurassic. Genera Camptonectes, Lioplacodes, Eumicrotis, Chœnomya. This work contains descriptions of new fresh-water Jurassic species, the first of that age discovered in North America. The work has additional importance in consequence of the philosophical discussion of important questions.

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Meek, F. B. Description of fossils from the auriferous slates of California. <Geol. surv. California, Geology, vol. i. (Appendix B), pp. 477–482, 1 plate, 1865. Published by authority of the legislature of California, 1865. Philadelphia, 1865.

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Meek, F. B. Remarks on the Carboniferous and Cretaceous Rocks of Eastern Kansas and Nebraska, and their relations to those of the adjacent States, and other localities farther eastward, in connection with a review of a paper recently published on this subject by M. Jules Marcou, in the Bulletin of the Geological Society of France. <Am. Journ. Sci., vol. xxxix, 2d ser., pp. 157–174. 1865. New Haven, 1865.

The paper of Professor Marcou's referred to is the "Reconnaissance geologique du Nebraska," par Jules Marcou. Bull. Geol. Soc. France, xxi, pp. 132–147, January, 1864.

At the close of the paper Meek & Worthen describe:

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32.

Meek, F. B., *and* **Worthen, A. H.** Note in relation to a genus of Crinoids from the Coal measures of Illinois and Nebraska, proposed by them on page 174 of this volume of the Journal. <Am. Journ. Sci., vol. xxxix, 2d ser., p. 350. 1865. New Haven, 1865.

The authors regard their genus Erisocrinus as identical with Philocrinus de Koninck.
Erisocrinus typus is changed to *Philocrinus pelvis*, M. & W.
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Meek, F. B. Preliminary notice of a small collection of fossils found by Dr. Hays (Hayes) on the west shore of Kennedy channel, at the highest northern localities ever explored. <Am. Journ. Sci., vol. xl, 2d ser., pp. 31–34. 1865. New Haven, 1865.

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34.

Meek, F. B. Note on the genus Gilbertsocrinus Phillips. <Proc. Acad. Nat. Sci. Phila., vol. xvii, pp. 166–167. 1865. Philadelphia, 1865.

The author takes the ground that the difference between Gilbertsocrinus Phillips, Goniasteroidocrinus Lyon & Casseday, and Trematocrinus Hall, is at most not more than subgeneric.

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Meek, F. B. Observations on the microscopic shell structure of Spirifer cuspidatus, Sowerby, and some similar American forms. <Proc. Acad. Nat. Sci. Phila., vol. xvii, pp. 275–277. 1865. Philadelphia.

36.

Meek, F. B., *and* **Worthen, A. H.** Notice of some new types of organic remains from the Coal-measures of Illinois. <Proc. Acad. Nat. Sci. Phila., vol. xvii, pp. 41–53. 1865. Philadelphia, 1865.

Genera Acanthotelson, Palæocaris, Anthracerpes, Palæocampa, afterward republished and illustrated in vol. iii of the Illinois Geological Reports.

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37.

Meek, F. B., *and* Worthen, A. H. Remarks on the genus Taxocrinus (Phillips). McCoy, 1844; and its relations to Forbesiocrinus de Koninck and Le Hon, 1854, with descriptions of new species. < Proc. Acad. Nat. Sci. Phila., vol. xvii, pp, 138–143. 1865. Philadelphia, 1865.

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38.

Meek, F. B., *and* Worthen, A. H. Descriptions of new species of Crinoidea, &c., from the Paleozoic rocks of Illinois and some of the adjoining States. < Proc. Acad. Nat. Sci. Phila., vol. xvii, pp. 143–155. 1865. Philadelphia, 1865.

A "note in regard to the name Cincinnati group used in the foregoing paper" is appended on page 155; the descriptions are republished and the views restated in the Illinois Geological Reports, vol. i.

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39.

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40.

Meek, F. B., *and* **Worthen, A. H.** Contributions to the Paleontology of Illinois and other Western States. <Proc. Acad. Nat. Sci. Phila., vol. xvii, pp. 245–273, 1865. Philadelphia, 1865.

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In a note the authors consider their previously proposed Evactinopora as equivalent to Conodictyum Münster, and call their species C. radiatum.

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Genera Sphenopoterium, Cardiopsis, Trematodiscus, Strotocrinus, Steganocrinus, Cœlocrinus, Oligoporus, Eriocrinus; Syntrielasma, Eumicrotis, Trachydomia, Orthonema, Soleniscus, Acanthotelson, Palæocaris, Anthracerpes, Palæocampa, Shænaster. Volumes ii, iii, v, and vi of these reports all comprise very important works on Invertebrate Paleontology, in which are not only species and genera described, but higher groups are defined, and many important questions are philosophically discussed.

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* σφην, a wedge, ποτηριον, a drinking cup.

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[*] στρωτος, spread; χρινον, a lily.

[†] στεγανος, covered; χρινον, a lily; in allusion to the covered free rays.

[‡] χοιλος, hollow; χρινον, a lily.

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  - *A. amplus*, M. & W., 1860, pl. xviii, figs. 4 *a–c* 257–258
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INVERTEBRATE FOSSILS OF THE ST. LOUIS GROUP.

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* 'ολιγος, few; Πορος, a passage.

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* σχοινος, a rope; αστηρ, a star.

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* *ενδον*, within; *λοβος*, a lobe. † *μονος*, solitary; *πτερον*, a wing.

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* τραχος, rough; δωμα, a house.

† ορθος, straight; νημα, a thread.

‡ παλαιος, ancient; χαρις, a shrimp.

§ σωληνισχος, a little channel or gutter.

‖ ανθραξ, coal; ʽερπω, to creep.

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Meek, F. B. Check-lists of the Invertebrate fossils of North America. Cretaceous and Jurassic. < Smithsonian Miscellaneous Collections (No. 177), pp. 1–40. 1864. Washington, 1867.

Contains, besides list, "Notes and explanations" of generic and specific characters of much importance.

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[*] παλαιος, ancient; χαμπη, a caterpillar.

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MEEK, F. B. Check lists of the Invertebrate fossils of North America. Miocene. <Smithsonian Miscellaneous Collections (No. 183), pp. 1–32, 1864. Washington, 1867.

Contains, besides the list, "Notes and explanations" of generic and specific characters.

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47.

MEEK, F. B. Note on Bellinurus Danæ, from the Illinois Coal-measures. <Am. Journ. Sci., vol. xliii, 2d ser., pp. 257, 258. 1867. New Haven, 1867.

In this note the author expresses the opinion that Bellinurus danæ, Meek and Worthen, properly belongs to the recently proposed genus Prestwichia, Woodward.

48.

MEEK, F. B. Note on a new genus of fossil Crustacea. <Am. Journ. Sci., vol. xliii, 2d ser., pp. 394, 395. 1867. New Haven, 1867.

Genus Euprōops. This genus was afterward fully described and illustrated in vol. iii of Worthen's Illinois Geological Reports.

49.

MEEK, F. B. On the punctate shell-structure of Syringothyris. <Am. Journ. Sci., vol. xliii, 2d ser., pp. 407, 408. 1867. New Haven, 1867.

50.

MEEK, F. B. Remarks on Professor Geinitz's views respecting the Upper Paleozoic rocks and Fossils of Southeastern Nebraska. <Am. Journ. Sci., vol. xliv, 2d ser., pp. 170–187; continued, pp. 327–339; notes to the same pp. 282, 283. 1867. New Haven, 1867.

This is an extended discussion and criticism of Dr. Geinits's "Carbon formation und Dyas in Nebraska." The following fossils are discussed especially:

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51.

MEEK, F. B. Note on the genus Palæacis, Haime, 1860 (=Sphenopoterium, M. & W., 1866.) <Am. Journ. Sci., vol. xliv, 2d ser., pp. 419, 420. 1867. New Haven, 1867.

The author here takes the view that Sphenopoterium, originally published in the Illinois Geol. Reports, is identical with Palæacis.

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52.

MEEK, F. B. Fossils from the west coast of Kennedy Channel. <Hayes's "Open Polar Ocean," London, 1867, p. 341.

Describes various fossils collected by Dr. Hayes on the west coast of Kennedy's Channel, from deposits of lower Helderberg age. *Zaphrentis hayesii* and *Loxonema ? kanei* are described as new species. A preliminary notice appeared in Am. Journ. Sci. and Arts, ser. 2, vol. xl, pp. 31–34. New Haven, 1865.

For list of species see entry number 33, p. 36.

53.

Meek, F. B. Preliminary notice of a remarkable new genus of corals, probably typical of a new family; forwarded for study by Prof. J. D. Whitney, from the Silurian rocks of Nevada Territory. <Am. Journ. Sci., vol. xlv, 2d ser., pp. 62–64. 1868. New Haven.

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54.

Meek, F. B. Note on the shell-structure and family affinities of the genus Aviculopecten. <Am. Journ. Sci., vol. xlv, 2d ser., pp. 64, 65. 1868. New Haven, 1868.

The author shows that by the shell-structure the Aviculopectens are allied to Avicula rather than to Pecten.

55.

Meek, F. B., *and* **Worthen, A. H.** Preliminary notice of a Scorpion, a Eurypterus? and other fossils, from the Coal-measures of Illinois. <Am. Jour. Sci., vol. xlvi, 2d ser., pp. 19–28. 1868. New Haven, 1868.

Afterward fully described and illustrated in one of the Illinois Geological Reports, vol. iii.

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56.

Meek, F. B. Note on Ethmophyllum and Archeocyathus. <Am. Journ. Sci., vol. xlvi, 2d ser., p. 144. 1868. New Haven, 1868.

The author abandons his formerly proposed genus Ethmophyllum, believing it to be identical with Archeocyathus of Billings.

57.

Meek, F. B., *and* **Worthen, A. H.** Notes on some points in the Structure and Habits of the Paleozoic Crinoidea. <Proc. Acad. Nat. Sci. Phila., vol. xx, pp. 323–334. 1868. Philadelphia, 1868.

Afterward republished in the Illinois Geological Reports, vol. v, and in Amer. Jour. Sci. and Canad. Nat. See entries Nos. 61 and 64.

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58.

MEEK, F. B., *and* WORTHEN, A. H. Remarks on some types of Carboniferous Crinoidea, with descriptions of new Genera and Species of the same, and of one Echinoid. <Proc. Acad. Nat. Sci. Phila., vol. xx, pp. 335–359. 1868. Philadelphia, 1868.

Genera Barycrinus, Nipterocrinus. Afterward republished in the Illinois Geological Reports, vol. v.

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59.

MEEK, F. B., *and* WORTHEN, A. H. Paleontology. <Geological Survey of Illinois, vol. iii, pp. 291–565, plates 1–20. 1868. Springfield, 1868.

Published by authority of the legislature of Illinois, 1868.
Silurian, Devonian, and Carboniferous.

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*βαρύς, heavy; Κρίνον, a lily.

†νιπτήρ, a washing vessel; Κρινον, a lily.

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* μικρος, small; χυχλος, a circle.

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* *ισος*, equal; *νημα*, a thread.

† *βυρσα*, a purse; *χρινον*, a lily.

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* λεπις, a scale; εσθης, a garment.

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* *ονυξ*, a claw; *αστηρ*, a star.

† Mazon, name of stream.

60.

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Dithyrocaris carbonarius, n. s., M. & W., 1870	55–56

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Conocoryphe (*Conocephalites*) *kingii*, n. s., Meek, 1870	63–64

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Meek, F. B. Geology of the Line of the Great Pacific Railroad. [In a letter to Dr. J. J. Bigsby.] <Geological Magazine, Decade I, vol. vii, pp. 163–164. 1870. London, 1870.

Notes the fossils obtained by Mr. Clarence King along the line of the Pacific Railway.

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* σωλην, a channel; Χεῖλος, lip.

69.

Meek, F. B. A Preliminary List of Fossils collected by Dr. Hayden in Colorado, N
Mexico, and California, with Brief Descriptions of a few of the New Speci
<Proc. Am. Philos. Soc., vol. xi, pp. 425–431. 1870. Philadelphia, 1871.

Silurian, Carboniferous, Jurassic, Cretaceous, and Tertiary.

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70.

Meek, F. B. Preliminary notice of a new species of Trimerella from Ohio. <A
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Trimerella ohioensis. Republished and illustrated in Paleontology of Ohio (Newberry).

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Meek, F. B. On some new Silurian Crinoids and Shells. <Am. Journ. Sci., vol.
3d ser., pp. 295–302. 1871. New Haven, 1871.

This article consists of descriptions of species, together with some extended remarks on
genus Lichenocrinus of Hall.

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72.

Meek, F. B. Descriptions of new species of invertebrate fossils from the Carbon
erous and Devonian rocks of Ohio. <Proc. Acad. Nat. Sci. Phila., vol. xx
pp. 57–93. 1871. Philadelphia, 1871.

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* This description was accidentally inserted by Mr. Meek in this place

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73.

Meek, F. B. Descriptions of new species of fossils from Ohio and other Western States and Territories. <Proc. Acad. Nat. Sci. Phila., vol. xxiii, pp. 159–184. 1871. Philadelphia, 1871.

This paper contains descriptions of fossils, mostly Carboniferous, from Ohio, Illinois, and Texas, with a Melantho and Viviparus from Wyoming.

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74.

MEEK, F. B. Notice of a new Brachiopod, from the lead-bearing rocks at Mine L Motte, Missouri. <Proc. Acad., Nat. Sci. Phila., vol. xxiii, pp. 185–187. woodcuts. 1871. Philadelphia, 1871.

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75.

MEEK, F. B. Descriptions of new Western Palæozoic fossils, mainly from the Cincinnati Group of the Lower Silurian series of Ohio. <Proc. Acad. Nat. Sci. Phila. vol. xxiii, pp. 308–336. 1872. Philadelphia, 1871.

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76.

MEEK, F. B. Descriptions of some new types of Palæozoic shells. <Am. Jour Conch., vol. vii, pp. 4–10. 1 plate. 1871–1872. Philadelphia, 1872.

Carboniferous and Cretaceous? Genera Promacrus, Prothyris.

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77.

MEEK, F. B. List of Carboniferous fossils from West Virginia, with descriptions of new species. <Appendix B, Report of Regents of West Virginia University for 1870, pp. 67–73 or 1–7. 1871. Wheeling, 1871.

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MEEK, F. B. Remarks on the Genus Lichenocrinus. <Ann. and Mag. Nat. Hist., ser. 4, vol. viii, pp. 341–345. 1871. London, 1871.

A reprint from Amer. Journ. Sci. & Arts, 1871. See entry number 71.

79.

MEEK, F. B. Supplementary note on the Genus Lichenocrinus. <Ann. and Mag. Nat. Hist., ser. 4, vol. ix, pp. 247–248. 1872. London, 1872.

An additional description of the characters of Lichenocrinus, founded on a number of fresh specimens. The author concludes that it is an aberrant type of Cystoidea, representing a distinct family. See entry number 80.

80.

MEEK, F. B. Supplementary Note on the Genus Lichenocrinus. <Am. Journ. Sci., vol. iii, 3d ser., pp. 15–17. 1872. New Haven, 1872.

This is supplementary to the article at page 299 of vol. ii. See entry numbers 71 and 79.

81.

MEEK, F. B. Descriptions of two new starfishes, and a Crinoid, from the Cincinnati group of Ohio and Indiana. <Am. Journ. Sci., vol. iii, 3d ser., pp. 257–262. 1872. New Haven, 1872.

These descriptions, with illustrations, are republished in the Paleontology of Ohio (Newberry).

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82.

MEEK, F. B. Descriptions of New Species of Fossils from the Cincinnati Group of Ohio. <Am. Journ. Sci., vol. iii, 3d ser., pp. 423–428. 1872. New Haven, 1872.

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83.

Meek, F. B. Descriptions of a few new species and one new genus of Silurian fossi from Ohio. <Am. Journ. Sci., vol. iv, 3d ser., pp. 274–281 1872. New Have 1872.

Genus Dicraniscus, afterward fully described and illustrated in the Paleontology of Oh (Newberry).

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84.

Meek, F. B. Preliminary Paleontological report consisting of lists of fossils, wit descriptions of some new types, &c. <Prelim. Rep. U. S. Geol. Surv. of Wyomin and Portions of Contiguous Territories, pp. 287–318. 1870. Washington, 1871.

Silurian, Carboniferous, Jurassic, Cretaceous, and Tertiary, Genera Arcopagella, Crassat lina, Leptesthes, Pyrgulifera.

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* Diminutive of δίκρανος a two-pronged fork.

85.

Meek, F. B. Preliminary list of the fossils collected by Dr. Hayden's exploring expedition of 1871 in Utah and Wyoming Territories, with descriptions of a few new species. <Prelim. Rep. of U. S. Geol. Surv. of Montana and portions of adjacent Territories. [Report for 1871,] pp. 373–377. 1872. Washington, 1872.

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Meek, F. B. Report on the Paleontology of Eastern Nebraska, with some remarks on the Carboniferous rocks of that district. <Final Rep. of the U. S. Geol. Surv. of Nebraska and portions of the adjacent Territories, pp. 83–239. 11 plates. Washington, 1872.

Carboniferous fossils only. Genus Rhombopora.

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MEEK, F. B. [Geological reports on Miller, Morgan, and Saline Counties, Missouri.] <Reports on the Geological Survey of the State of Missouri, 1855–71, by G. C. Broadhead, F. B. Meek, and B. F. Shumard, chapters vii–ix, pp. 111–188. Jefferson City, 1873.

Geological maps of Miller and Morgan Counties accompany these reports.

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88.

Meek, F. B. Spergen Hill fossils identified among specimens from Idaho. <Am. Journ. Sci., vol. v, 3d ser., pp. 383, 384. 1873. New Haven, 1873.

The author identifies, among some collections made by Prof. F. H. Bradley, some of the minute species of Mollusca, for which the locality in Washington County, Indiana, known as Spergen Hill, is noted. A list of the species identified is given, but no discussion of them is made.

89.

Meek, F. B. Preliminary Paleontological Report, consisting of lists and descriptions of fossils, with remarks on the ages of the rocks in which they were found, &c., &c. <Sixth Ann. Report of the U. S. Geol. Survey of the Territories, pp. 431–518. 1873. Washington, 1873.

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90.

MEEK, F. B. Descriptions of Invertebrate fossils of the Silurian and Devonian systems. <Geol. Surv. of Ohio, vol. i, part ii. Palæontology, pp. 1–243, plates 1–23, and 3 plates of diagrams of Crinoids. 1873. Columbus, 1873.

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MEEK, F. B., *and* A. H. WORTHEN. Paleontology of Illinois. Descriptions of Invertebrates. <Geological Survey of Illinois, vol. vi, section ii, pp. 491–532, plates 23–32. 1875. Springfield, 1875.

Published by authority of the legislature, 1875.

Genus Carbonarca. A portion of these descriptions are by Mr. Worthen alone, and are not mentioned in the following list:

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Meek, F. B. Notice of a very large Goniatite from Eastern Kansas (Carboniferous). <Bulletin U. S. Geol. and Geog. Surv. of the Terr. No. 6, 2d ser., vol. i, p. 445. Washington, 1875.

The author regards it as at most only a variety of *G. globulosus*, Meek & Worthen, although attaining so great size.

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101.

Meek, F. B. Descriptions and illustrations of fossils from Vancouver's and Sucia Islands, and other Northwestern localities. <Bulletin U. S. Geol. and Geog. Surv. of the Terr., vol. ii, No. 4, pp. 351–374, 6 plates. 1876. Washington, 1876.

Carboniferous, Cretaceous, and Tertiary; mostly Cretaceous. A large part of the species embraced in this paper were originally described by the author in 1856 in vol. iv of Transactions Albany Institute, and are here redescribed with others and illustrated.

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MEEK, F. B. Note on the new genus Uintacrinus, Grinnell. <Bulletin U. S. Geol. and Geog. Surv. of the Terr., vol. ii, No. 4, pp. 375–378, 2 wood cuts. 1876. Washington, 1876.

This paper consists largely of a redescription and rectification of the genus.

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103.

MEEK, F. B. Descriptions of the Cretaceous Fossils collected on the San Juan exploring expedition under Capt. J. N. Macomb, U. S. Engineers. <Report of the Exploring Expedition from Santa Fé, New Mexico, to the junction of the Grand and Green rivers of the Great Colorado of the West, in 1859, pp. 121–133, pls. i and ii. Washington, 1876.

The exploration was made in 1859, but the report was not published until 1876, when Mr. Meek revised the work in accordance with his views at the time of publication.

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104.

Meek, F. B. Report on the Paleontological collections of the expedition, <Report Expl. Great Basin of the Terr. of Utah, in 1859. By J. H. Simpson. Appendix J, pp. 337–373, pls. i–v. Washington, 1876.

Devonian, Carboniferous, Jurassic, Cretaceous, and Tertiary. The explanations were made and the fossils collected nearly eighteen years before the publication of this report, but the paleontology was corrected in accordance with the views of the author at the time of publication.

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105.

Meek, F. B. A report on the Invertebrate Cretaceous and Tertiary Fossils of the Upper Missouri Country. <Rep. U. S. Geol. & Geogr. Surv. of the Terr. 4°. vol. ix, pp. i-xiv, 1-629, pls. i-xlv. Washington, 1876.

This great work contains descriptions and illustrations of nearly 300 species; more than 200 genera and subgenera are fully diagnosed, besides which full diagnoses of the families which embrace them are given; also philosophical discussion of many important questions. The greater part of the species embraced in this volume were previously, from time to time, described and published, mainly in the publications of the Acad. Nat. Sc. Phila.

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* μικρός, small; στίξις, puncture.

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* *κλωστήρ*, a spindle (diminutive of).

† Vanikoro; *ὄψις*, form.

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* ὀδούς, a tooth; *βάσις*, a base.

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[1] πατος, a path; κέρας, a horn.

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MEEK, F. B. Palæontology. < Rep. Geol. Expl. 40th Parallel, vol. iv, part i, pp. 1-197, pls. i-xvii. Washington, 1877.

Silurian, Devonian, Carboniferous, Triassic, Jurassic, Cretaceous, Tertiary. Genera *Eutomoceras* (Hyatt), *Eudiscoceras* (Hyatt), *Polyrhytis*, *Rhytophorus*, *Pyrgulifera*.

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*κόρυς, a helmet; κερας, a horn.

†γυμνός, naked; νῶτος, back; κερας, a horn.

‡ἀκροχορδών, a wart; κερας, a horn.

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PART II.

THE PUBLISHED WRITINGS OF CHARLES ABIATHAR WHITE, 1860–1884.

II.—THE PUBLISHED WRITINGS OF CHARLES ABIATHAR WHITE, A. M., M. D.

This catalogue is intended to embrace the titles and place of publication, not only of all the scientific writings of Dr. White, but his reviews of the writings of other authors, and his more popular articles also. In only a few instances however, are newspaper articles, of which he has written many; noticed on the following pages; but the intention has been to make entry of all his short published notes which contain any expression of his views upon scientific subjects, as well as of his more elaborate works. The annotations which accompany this catalogue are made up mainly from data furnished by the author of the works, and all expressions of opinion upon geologic and paleontologic subjects contained in them should be regarded as his own.

Charles A. White was born in North Dighton, Bristol County, Massachusetts, on January 26, 1826. He has held the following official positions in education and science, to which subjects most of his writings pertain: State Geologist of Iowa, by legislative appointment, from 1866 to 1869, inclusive; Professor of Natural History in the Iowa State University, from 1867 to 1873; Professor of Natural History in Bowdoin College, from 1873 to 1875; Paleontologist to the U. S. Geographical and Geological Surveys West of the 100th Meridian, in charge of Lieut. George M. Wheeler, in 1874; Geologist and Paleontologist to the U. S. Geological Survey of the Territories, in charge of Maj. J. W. Powell, in 1875; Geologist and Paleontologist to the U. S. Geological Survey of the Territories, in charge of Dr. F. V. Hayden, from 1876 to 1879; in charge of paleontological collections in the U. S. National Museum from 1879 to 1882; detailed in 1881 to act as chief of the Artesian Wells Commission upon the Great Plains, under the auspices of the U. S. Agricultural Department; Geologist to the U. S. Geological Survey in 1882; Paleontologist to the U. S. Geological Survey in 1883, which position he now holds, together with honorary curatorship in the U. S. National Museum; President of the Biological Society of Washington for the years 1883 and 1884.

A partial bibliography of Dr. White appeared in the "American Field" for March and April, 1885; this is by Charles Aldrich.

1.

WHITE, C. A. **Observations upon the Geology and Paleontology of Burlington, Iowa, and its Vicinity.** <Bost. Jour. Nat. Hist., (Bost. Soc. Nat. Hist.) vol. vii, pp. 209-235. Boston, 1861.

Same. Boston, 1860, 8vo., p. 209-235. Fifty separates printed without title-page, covers, or repaging.

The 50 separates appeared at the date mentioned, but Part II of vol. vii, according to a note inserted in it, did not appear until December, 1862, although it bears the imprint 1861.

This paper is divided into two parts; in the first, details of local geology are given, and attention is called to the fact that in this locality the change from Devonian to Carboniferous took place so gradually as to render it impossible to point out the exact line where one ends and the other begins. A section of the rocks at Burlington is given with a table showing the vertical range of shells, and a list of the genera discovered in the rocks at Burlington, showing the different beds in which they have been recognized.

The second part contains descriptions of seven new species of *Brachiopoda* from the Chemung rocks at Burlington, Iowa.

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2.

WHITE, C. A., and WHITFIELD, R. P. **Observations upon the Rocks of the Mississippi Valley which have been referred to the Chemung Group of New York, together with Descriptions of New Species of Fossils from the same horizon at Burlington, Iowa.** <Proc. Bost. Soc. Nat. Hist., vol. viii, pp. 289-306. Boston, 1862.

Same. Boston, 1862, 8vo., pp. 289-306. Fifty separates printed without title-page, covers, or repaging.

Thirty-one species of Lower Carboniferous fossils are described in this paper.

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3.

White, C. A. Observations on the Summit Structure of Pentremites, the Structure and Arrangement of certain Parts of Crinoids, and Descriptions of New Species from the Carboniferous Rocks of Burlington, Iowa. < Boston Jour. Nat. Hist. (Boston Soc. Nat. Hist.), vol. vii, pp. 481–506. Boston, 1863.

Same. Boston, 1863. 8vo, pp. 581–506. Fifty separates printed without title-page, covers, or repaging.

The summit structure of *Pentremites norwoodi*, *P. stelliformis*, *P. lineatus*, and *P. elongatus* is noticed. Instances of the recuperative power of Crinoids are also given. The genus *Cœliocrinus* is proposed, and five species of Crinoids are described.

Some observations on certain modifications of the structure of the probosces of *Actinocrinus* are given, p. 489–491.

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* Κοιλία, venter; κρίνον, lilium.

4.

White, C. A. Descriptions of new species of Fossils from the Devonian and Carboniferous Rocks of the Mississippi Valley. < Proc. Boston Soc. Nat. Hist., vol. ix, pp. 8–33. Boston, 1865.

Same. Boston, 1862. 8vo, pp. 8–33. Fifty separates printed without title-page, covers, or repaging.

Forty-five species and two varieties of fossils are described, and the genera *Belemnocrinus* and *Acambona* are proposed. The author now regards the latter as identical with *Eumicrotis*, Hall.

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* βελεμνον, a dart; κρινον, a lily.

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5.

WHITE, C. A. Fœtal hydrocephalus. <Chicago Medical Journal, vol. xxii, pp. 55–57. Chicago, 1865.

A report of an obstetrical case in which the child's cranium was too much enlarged to pass through the pelvic arch, and the serum was drawn off by an operation *in utero*.

6.

WHITE, C. A. Cerebro-spinal meningitis. <Chicago Medical Journal, vol. xxii, pp. 529–532. Chicago, 1865.

A report of a successful case, in which the application of dry heat to the extremities was a leading feature of the treatment.

7.

WHITE, C. A. The Soils of Iowa and their origin. <Report of the Secretary of the Iowa State Agricultural Society for the year 1865. pp. 245–267. Des Moines, 1866.

A popular lecture, delivered before the Society September 29, 1865. Some of the views expressed in the lecture have since been much modified by the author.

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*ἀχη, a point; ἀμβων, umbo.

8.

WHITE, C. A. Observations on the genus Belemnocrinus. <Proc. Boston Soc. Nat. Hist., vol. x, p. 180. Boston, 1866.

This note is merely a rectification of the generic formula of *Belemnocrinus* as it was originally published in volume ix.

9.

WHITE, C. A. First Annual Report of Progress, of Charles A. White, State Geologist. pp. 1-4. Des Moines, 1867.

Probably not over fifty copies of this report were printed in its original form. It was reprinted on pages 5 to 8 of the first and second annual reports, Des Moines, 1868. See entry No. 20.

10.

WHITE, C. A. and ST. JOHN, O. H. Preliminary notice of new genera and species of fossils. By C. A. White, M. D., State Geologist, and O. H. St. John, Assistant. [pp. 1-3.] Iowa City, May 8, 1867.

This small publication of only fifty copies was made by the Iowa State Geological Survey. Four species are described. The genus *Meekella* proposed, *Oryptacanthia* suggested; and the whole, together with other matter, was republished in Vol. I, Transactions of the Chicago Academy of Sciences. See entry No. 15.

Protozoa.

Amphistegina, White & St. John, 1867.

Mollusca.

Aulosteges spondyliformis, n. s., White & St. John, 1867.
Waldheimia compacta, n. s., White & St. John, 1867.
Beyrichia lithofactor, n. s., White & St. John, 1867.
Beyrichia lithofactor var. *velata*, White & St. John, 1867.
Meekella, n. g., White & St. John, 1867.

11.

WHITE, C. A. Observations upon the Drift phenomena of Southwestern Iowa. <Amer. Jour. Sci., 2d ser., vol. xliii, pp. 301-305. New Haven, 1867.

Same. New Haven, 1867. 8vo., pp. 301-305. Twenty-five separates printed without covers, title-page, or repaging.

Mentions the occurrence of glacial striæ upon rocks *in situ*.

12.

WHITE, C. A. A Sketch of the Geology of Southwestern Iowa. <Amer. Jour. Sci., 2d ser., vol. xliv, pp. 23-31. New Haven, 1867.

Same. New Haven, 1867. 8vo, pp. 23-31. Twenty-five separates printed without title-page, covers, or repaging.

It is shown that the limestones of the region discussed belong to the upper and not to the lower Carboniferous series, as had been supposed by some previous authors.

13.

WHITE, C. A. Drift phenomena in Southwestern Iowa. <Amer. Jour. Sci., 2d ser., vol. xliv, p. 119. New Haven, 1867.

This is an additional note to the article of the preceding entry, which was inadvertently omitted by the printer.

14.

WHITE, C. A. Exogenous leaves in the Cretaceous rocks of Iowa. <Amer. Jour. Sci., 2d ser., vol. xliv, p. 119. New Haven, 1867.

A note announcing the discovery of exogenous leaves, and showing that the "Nishnabotany sandstone" is identical with the Dakota group.

15.

WHITE. C. A., and ST. JOHN, O. H. Descriptions of new Subcarboniferous and Coal-Measure Fossils, collected upon the Geological Survey of Iowa, together with notice of new generic characters observed in two species of Brachiopods. <Trans. Chicago Acad. Sci., vol. i, pp. 115–127, figs. 1–12. Chicago, 1867.

Same. Chicago, 1867. pp. 115–127. Fifty separates printed without title-page, covers, or repaging.

Fourteen species are described, four of which were previously described in the paper, entry No. 10. The genus *Tomoceras* is proposed, and the previously suggested genera *Meekella* and *Cryptacanthia* are proposed and illustrated.

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16.

WHITE, C. A. Character of the Unconformability of the Iowa Coal-measures upon the Older Rocks. <Am. Jour. Sci., 2d ser., vol. xlv, pp. 331–334. New Haven, 1868.

Same. New Haven, 1868, 8vo., pp. 331–334. Twenty-five separates printed without title-page, covers, or repaging.

17.

WHITE, C. A. On Coal in Nebraska, with reference to a paragraph in the Geological Report of Dr. Hayden. <Am. Jour. Sci., 2d ser., vol. xlv., pp. 399–400. New Haven, 1868.

The paragraph referred to is on page 125 of the report of the Commissioner of the General Land Office for the year 1867.

18.

WHITE, C. A. Note on the shell-structure of certain Naiades. <Am. Jour. Sci., 2d ser., vol. xlv, pp. 400–401. New Haven, 1868.

The outer prismatic layer of the shell is noticed as a family character, not as a new discovery, as was supposed by Meek.

19.

WHITE, C. A. Note on "Cone-in-cone." <Am. Jour. Sci., 2d ser., vol. xlv, pp. 401–402. New Haven, 1868.

20.

WHITE, C. A. First and Second Annual Report of Progress by the State Geologist, and the Assistant and Chemist; on the Geological Survey of the State of Iowa; together with the substance of Popular Letters contributed to the Newspapers of the State during the years 1866 and 1867, in accordance with law; also extracts originally contributed to Scientific Journals as a part of the work of the Survey. pp. 1–284. Des Moines, 1868.

The brief first annual report (Entry No. 9) is reprinted in this volume, upon pages 5–8.

21.

WHITE, C. A. Lakes of Iowa, Past and Present. <American Naturalist, vol. ii, pp. 143–155. Salem, 1868.

Same. Salem, 1868, pp. 143–155. Thirty separates printed without title-page, covers, or repaging.

The Drift lakes, including the so-called walled lakes, are described, and the origin of the "walls" explained. Also the Bluff deposit of the Missouri River valley is shown to be the deposit of an ancient lake.

22.

WHITE, C. A. The Iowa Drift. <American Naturalist, vol. ii, pp. 615–616. Salem, 1869.

The derivation of the drift material from the underlying rocks, by their disintegration and comminution, is shown.

23.

WHITE, C. A. A trip to the Great Red Pipestone Quarry. <American Naturalist, vol. ii, pp. 644–653. Salem, 1869.

Same. Salem, 1869, 8vo., pp. 644–653. Thirty separates printed without title-page, covers, or repaging.

The quarry, the region, and the formation which contains the pipestone, are described.

24.

WHITE, C. A. Are Unios sensitive to light? <Am. Jour. Sci., 2d ser., vol. xlvii, pp. 280–281. New Haven, 1869.

An experiment is described, showing that the sensitiveness which Unios manifest when the sun's rays are suddenly intercepted by an opaque body, is due to an interruption of light rays, and not heat rays.

25.

White, C. A. Announcement of the Existence of Cretaceous Rocks in Guthrie County, Iowa. <Proc. Amer. Ass. Adv. Sci., 17th Meeting. Chicago, 1868, vol. xvii, pp. 326–327. Cambridge, 1869.

26.

White, C. A. Observation on the Red Quartzite Bowlders of Western Iowa; and their original ledges of Red Quartzite in Iowa, Dakota, and Minnesota. <Proc. Amer. Ass. Adv. Sci., 17th Meeting. Chicago, 1868, vol. xvii, pp. 340–342. Cambridge, 1869.

Same. Cambridge, 1869, pp. 340–342. Thirty separates printed without title page, covers, or repaging.

27.

White, C. A. Report on the Geological Survey of the State of Iowa, to the Thirteenth General Assembly, January, 1870, Containing results of Examinations and Observations made within the years 1866, 1867, 1868, and 1869. By Charles A. White, M. D., Geological Corps; Charles A. White, State Geologist; Orestes H. St. John, Assistant; Rush Emery, Chemist. Vols. I and II. Des Moines, 1870.

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One Geological map of the State, colored.	

28.

WHITE, C. A. Natural Science in our Common Schools. <Iowa School Journal, vol. xii, pp. 1-4. Des Moines, 1870.

Methods of interesting school children in natural history are suggested.

29.

WHITE, C. A. Kjœkkenmœddings in Iowa. <American Naturalist, vol. iii, pp. 54-55. Salem, 1870.

This is the first public announcement of the fact that the shell-heaps of the western rivers are true kjœkkenmœddings.

30.

WHITE, C. A. Lilies of the Rocks. <American Naturalist, vol. iii, pp. 553-554. Salem, 1870.

A review of part of an article by G. Hinrichs, in the August No., vol. iii, of the Naturalist entitled "Lilies of the Fields, of the Rocks, and the Clouds." This note is signed "Zoologicus."

31.

WHITE, C. A. Prairie Fires. <American Naturalist, vol. v, pp. 68-70. Salem, 1871.

An incident of personal experience related.

32.

WHITE, C. A. Albino Flowers. <American Naturalist, vol. v, pp. 161-162. Salem, 1871.

It is observed that a certain cluster of the common field clover produced white flowers one year, and those of the ordinary red color the next. Also, that a specimen of white *Liatris* was observed, the latter being deemed important because the rose-red color is common to the whole genus.

33.

WHITE, C. A. [Remarks on the "Geological History of the Gulf of Mexico" by Prof. E. W. Hilgard.] <American Naturalist, vol. v, pp. 519-520. Salem, 1871.

These remarks were made before the American Association for the Advancement of Science, at the 20th (Indianapolis) meeting, 1871, with reference to the paper above cited.

34.

WHITE, C. A. [Remarks on the homologies of the Carpal and Tarsal bones in Birds.] <American Naturalist, vol. v, p. 525. Salem, 1871.

These remarks were made before the American Association for the Advancement of Science, 20th meeting (Indianapolis), with reference to a paper read by E. S. Morse, "On the Carpal and Tarsal bones of Birds."

35.

WHITE, C. A. Mammoth Cave. <University Reporter, [a college paper of the Iowa State University.] 4to. Vol. iv, pp. 81-83. Iowa City, 1872.

An account of a visit to Mammoth Cave, Kentucky, in company with the American Association for the Advancement of Science.

36.

WHITE, C. A. Manual of Physical Geography and Institutions of the State of Iowa. 4to. pp. 1-85, pls. i-iii and figs. Davenport, 1873.

This book was prepared for use in the schools of the State. It embraces an account of the history, constitution, and school laws of the State; its educational, charitable, and penal institutions, land surveys, elections, taxes, &c. In 1883 an edition was issued purporting to be the 15th and also to be revised, but it has never been revised by the author since the first *edition*.

37.

WHITE, C. A. Woodpeckers Tapping Sugar Trees. <American Naturalist, vol. vii, p. 496. Salem, 1873.

Woodpeckers were observed to peck holes in the bark of young and sound sugar maples, evidently to get the sap.

38.

WHITE, C. A. Kjœkkenmœddings de l'Amérique du nord. <Congrès International d'Anthropologie et d'Archéologie. Préhistoriques; Compte rendu de la cinquième session à Bologne, 1871. pp. 379-389. Bologna (Italy), 1873.

Same. Bologna (Italy), 1873. 8vo, pp. 15. Thirty separates printed with title-page and repaging.

This paper embraces a general review of the subject of shell heaps in North America as known up to that date.

39.

WHITE, C. A. On Spontaneous fission? in Zaphrentis. <Amer. Jour. Sc., 3d ser., vol. v., p. 72. New Haven, 1873.

A specimen of *Zaphrentis spinulifera*, Hall is described, which seemed to be a case of spontaneous fission. The author now thinks it probable that it was the result of a twin polyp, or that the fission took place at a very early stage in the formation of the corallite

40.

WHITE, C. A. On the Eastern Limit of Cretaceous Deposits in Iowa. <Proc. Amer. Ass. Adv. Sci. ? 21st meeting (Dubuque), 1872, vol. xxi, pp. 187-192. Cambridge, 1873.

Same. Cambridge, 1873. 8vo. pp. 187-192. Fifty separates printed without title-page, covers, or repaging.

The discovery is announced of Cretaceous fossils in the drift or glacier-disturbed Cretaceous deposits in Howard, Black Hawk, and Johnson Counties, Iowa; showing that the Cretaceous deposits once extended as far eastward as Eastern Iowa and Southeastern Minnesota.

41.

WHITE, C. A. The proposed genus Anomalodonta of Miller identical with the earlier Megaptera of Meek. <Amer. Jour. Sci., 3d ser., vol. viii, pp. 218-219. New Haven, 1874.

Meek's claim to priority is defended against that of Miller. The note bears only the initials of the author, "C. A. W."

42.

WHITE, C. A. Artificial Shell-heaps of Fresh-water Mollusks. <Proc. Amer. Ass. Adv. Sci., 22d meeting, Portland, 1873, pp. 133-137. Salem, 1874.

Same. Salem, 1874. 8vo. pp. 133-137. Fifty separates printed without title-page, covers, or repaging.

It is herein shown that the fresh-water mollusks were extensively used as food by the aboriginal inhabitants.

43.

WHITE, C. A. Preliminary Report upon Invertebrate Fossils collected by the Expeditions of 1871, 1872, and 1873, with Descriptions of New Species. <Engineer Department, U. S. Army. Geographical and Geological Explorations and Suryevs west of the 100th meridian. First Lieut. George M. Wheeler, Corps of Engineers, in charge. pp. 1-27. Washington, 1874.

Thirty-nine species are described as new, and five others are noticed. They are all redescribed and figured in part i, vol. iv, Report upon Geographical and Geological Explorations and Surveys West of the 100th Meridian. See entry No. 48 *Anchura nuptialis* is a Cretaceous species, and herein wrongly referred to the Jurassic.

LOWER SILURIAN

PRIMORDIAL PERIOD.

Plantæ.

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C. rustica, n. s., White, 1874 5-6

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[*] λίσπος, smooth, and ἐσθης, a garment.

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49.

White, C. A. Invertebrate Paleontology of the Plateau Province, together with notice of a few species from localities beyond its limits in Colorado. <United States Geological and Geographical Survey of the Territories: Report on the Geology of the Uintah Mountains. By J. W. Powell. 4to, pp. 74–135. Washington, 1876.

Same. Washington, 1876. 4to, pp. 74–135. Fifty separates printed without title-page, covers, or repaging.

This memoir embraces some general geological discussions, catalogues of fossils, and descriptions of 48 new species.

In subsequent works the author has referred to the Laramie group some of the fossils herein assigned, respectively, to the Cretaceous and Tertiary. Most of the species have since been illustrated by the author in various works.

General observations, pp. 75–87.

Catalogue of the fossils collected by the various parties in the field during the years 1868 to 1875, inclusive, pp. 88–107.

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50.

WHITE, C. A. In Memoriam: Fielding Bradford Meek. <Am. Jour. Sci., 3d ser., vol. xiii, pp. 169–171. New Haven, 1877.

Same. New Haven, 1877. 8vo, 3 pages. One hundred separates printed with half-title and repaging.

A brief sketch of the life and labors of the paleontologist, Mr. Meek.

51.

WHITE, C. A. Descriptions of new species of fossils from the Paleozoic rocks of Iowa. <Proc. Acad. Nat. Sci. Phila., for 1876, vol. xxviii, pp. 27–34. Philadelphia, 1877.

Same. Philadelphia, 1876. 8vo., pp. 27–34. Fifty separates printed without title-page, covers, or repaging.

Thirteen species are described as new, and the genus *Strobilocystites* is proposed.

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52.

White, C. A. Paleontological papers, No. 1: Descriptions of Unionidæ and Physidæ, collected by Prof. E. D. Cope, from the Judith River Group of Montana, during the summer of 1876. <Bulletin U. S. Geol. and Geog. Surv. of the Terr., vol. iii, art. xx, pp. 599–602. Washington, 1877.

Same. Washington: Government Printing Office, 1877. 8vo, pp. 599–602. Two hundred separates printed (author's edition) without repaging, but with title-page, and in paper covers, together with Paleontological Papers Nos. 2, 3, 4, and 5.

Six species are described as new. This is the first of a series of short unillustrated articles which reached eleven in number, and then ceased with the suspension of the survey in charge of Dr. Hayden. This form of title has not since been used by the author.

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53.

White, C. A. Paleontological Papers No. 2: Descriptions of new species of Uniones, and a new genus of fresh-water Gasteropoda from the Tertiary strata of Wyoming and Utah. <Bulletin U. S. Geol. and Geog. Surv. of the Terr., vol. iii, art. xxi, pp. 603–606. Washington, 1877.

Same. Washington: Government Printing Office, 1877. 8vo, pp. 603–606. Two hundred separates printed (author's edition) without repaging, but with title-page, and in paper covers, together with Paleontological Papers Nos. 1, 3, 4, and 5.

Four species are described as new, two preoccupied names changed, and the genus *Cassiopella* proposed.

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54.

White, C. A. Paleontological Papers No. 3: Catalogue of the Invertebrate Fossils, hitherto published from the fresh- and brackish-water deposits of the western portion of North America. <Bulletin U. S. Geol. and Geog. Surv. of the Terr., vol. iii, art. xxii, pp. 607–614. Washington, 1877.

Same. Washington: Government Printing Office, 1877. 8vo, pp. 607–614. Two hundred separates printed (author's edition) without repaging, but with title-page, and in paper covers, together with Paleontological Papers Nos. 1, 2, 4, and 5.

This paper contains a list of the fossil non-marine invertebrate forms at that time known. They have since been much increased. (See entry No. 115.)

The author has somewhat modified certain views expressed in this paper. These later views are published in entry No. 115.

55.

White, C. A. Paleontological Papers No. 4: Comparison of the North American Mesozoic and Cenozoic Unionidæ and associated mollusks with living species. <Bulletin U. S. Geol. and Geog. Surv. of the Terr., vol. iii, art. xxiii, pp. 615–624. Washington, 1877.

Same. Washington: Government Printing Office, 1877. 8vo, pp. 615–624. Two hundred separates printed (author's edition) without repaging, but with title-page, and in paper covers, together with Paleontological Papers Nos. 1, 2, 3, and 5.

The relations of the living Uniones of the Mississippi River system with the fossil forms from western North America are pointed out.

56.

White, C. A. Paleontological Papers No. 5: Remarks on the Paleontological characteristics of the Cenozoic and Mesozoic groups as developed in the Green River region. <Bulletin U. S. Geol. and Geog. Surv. of the Terr., vol. iii, art. xxiv, pp. 625–629. Washington, 1877.

Same. Washington: Government Printing Office, 1877. 8vo, pp. 625–629. Two hundred separates printed (author's edition) without repaging, but with title-page, and in paper covers, together with Paleontological Papers Nos. 1, 2, 3, and 4.

Same. Washington: Government Printing Office, 1878. 8vo, pp. 721–724. Two hundred separates printed (author's edition) without repaging, but with title-page, and in paper covers, together with Paleontological Papers No. 6.

57.

White, C. A. Circulation of the Blood, subjectively seen. <Am. Journ. of the Med. Sci., vol. lxxiii, n. s., p. 279. Philadelphia, 1877.

The appearance of multitudes of rapidly moving corpuscles to be observed when the eyes are shut, especially when there is more or less cerebral excitement, the author conceives to be due to the impact of the blood corpuscles behind the layer of rods and cones.

58.

White, C. A. Paleontological Papers No. 6: Descriptions of new species of Invertebrate fossils from the Laramie Group. < Bulletin U. S. Geol. and Geog. Surv. of the Terr., vol. iv., art. xxviii, pp. 707–719. Washington, 1878.

Same. Washington: Government Printing Office, 1878. 8vo, pp. 707–719. Two hundred separates printed (author's edition) without repaging, but with title-page, and in paper covers, together with Paleontological Papers No. 7.

Nineteen species of mollusks are described as new.

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59.

WHITE, C. A. Paleontological Papers No. 7: On the distribution of Molluscan species in the Laramie Group. <Bulletin U. S. Geol. and Geog. Surv. of the Terr. vol. iv, art. xxix, pp. 721–724. Washington, 1878.

The unity of the Judith River, Fort Union, Lignitic, and Bitter Creek series, as the Laramie Group is shown in this paper.

60.

WHITE, C. A. Paleontological papers No. 8. Remarks upon the Laramie group. <Bulletin U. S. Geol. and Geogr. Surv. of the Terr., vol. iv, art. xxxvi, pp. 865–876. Washington, 1878.

Same. Washington: Government Printing Office, 1878. 8vo, pp. 865–876. Two hundred separates printed (author's edition), with title-page and paper covers, but without repaging.

The characteristics of the group and its probable geological age are discussed.

61.

WHITE, C. A., *and* NICHOLSON, H. A. Bibliography of North American Invertebrate Paleontology; being a report upon the publications that have hitherto been made upon the invertebrate paleontology of North America, including the West Indies and Greenland. By C. A. White, M. D., Paleontologist of the United States Geological Survey, and H. Alleyne Nicholson, M. D., D. Sc., Professor at the University of St. Andrews, Scotland. <Department of the Interior; United States Geological Survey of the Territories. Miscellaneous publications No. 10. Washington: Government Printing Office, 1878. 8vo, 132 pp.

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Part I. Embracing titles and abstracts of publications made in the United States. By C. A. White, M. D. pp. 7–69.

Part II. Embracing titles and abstracts of publications made in British North America, in the West Indies, and Europe. By H. Alleyne Nicholson, M. D., D. Sc., pp. 71–132.

62.

WHITE, C. A. Change in the habits of Toads. <Nature. 4to, vol. xvii, p. 242. London and New York, 1878.

Observations made in Colorado along irrigating ditches show that the toads there have formed, or reverted to, the habit of diving to the bottom, when disturbed, and remaining there like frogs.

63.

White, C. A. Note on the Re-establishment of Forests in Iowa, now in progress. <Amer. Jour. Sci., 3d ser., vol. xvi, p. 328. New Haven, 1878.

This note has reference to an article by Prof. Asa Gray in the same volume of the Journal, entitled, Forestry and Archæology.

64.

White, C. A. Report on the Geology of a portion of Northwestern Colorado. <Tenth Annual Report U. S. Geol. and Geogr. Surv. of the Terr. (for the year 1876), pp. 1–60. One map and one plate. Washington, 1878.

The structure of the eastern end of the Uinta Mountain range is shown, and its relation to the Park range of the Rocky Mountain system explained. The isolated up-thrust mountains are described, and the term "partiversal," as applied to dips, is first used in this report. The results of this work, as shown on the accompanying map, were subsequently incorporated in sheets iv and xi of the Atlas of Colorado and Portions of the Adjacent Territory, published in 1877 by the same survey.

65.

White, C. A. Note on the Garter Snake. <Amer. Naturalist, vol. xii, p. 53. Philadelphia, 1878.

This note records a supposed instance of the swallowing of a quantity of air by a garter snake immediately before diving to the bottom of a pool of water.

66.

White, C. A. Contributions to Invertebrate Paleontology, No. 1: Cretaceous Fossils of the Western States and Territories. <Eleventh Annual Report U. S. Geol. and Geogr. Surv. of the Terr. (for the year 1877), pp. 273–319, pls. i–x. Washington, 1879.

Same. Washington: Government Printing Office, 1879. 8vo, pp. 273–319, pls. i–x. Two hundred separates printed without repaging, but with title-page and paper covers. The title upon the title-page differs from that which heads the text by the omission of the word "Invertebrate."

Fifty-six species are described and figured, a part of which are new, but most of which had been previously described by different authors, without illustrations. This series of "Contributions" was established for the purpose of illustrating species of fossils previously described, as well as new forms. They number eight in all, and that form of title has not been subsequently used by the author in connection with his work for the United States Surveys.

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67.

WHITE, C. A. Descriptions of new species of Invertebrate fossils from the Carboniferous and Upper Silurian rocks of Illinois and Indiana. <Proc. Acad. Nat. Sci., Phila., vol. xxx, pp. 29–37. Philadelphia, 1878.

Same. 8 vo., pp. 29–37. Philadelphia, 1878. Thirty separates printed without title-page, covers, or repaging.

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68.

WHITE, C. A. Anecdote of the Great Horned Owl. <American Naturalist, vol. xiii, p. 783. Philadelphia, 1879.

This anecdote is told to illustrate the precision, rapidity, and extent of the action of the muscles of the neck of that owl. Its authorship is indicated only by the initials "C. A. W."

69.

WHITE, C. A. Remarks on the Jura-Trias of Western North America. <Am. Jour. Sci., vol. xvii, 3d ser., pp. 214–218. New Haven, 1879.

Same. New Haven, 1879. 8vo., pp. 214–218. Twenty separates printed without title-page, covers, or repaging.

Reference is made in this article to the Triassic fossils which are described in Paleontological Papers No. 9.

70.

WHITE, C. A. Report on the Paleontological Field-work for the season of 1877. <Eleventh Annual Report U. S. Geol. and Geog. Surv. of the Terr. (for the year 1877), pp. 161–272. Washington, 1879.

Same. Washington: Government Printing Office, 1879. 8vo, pp. 161–272. Two hundred separates printed, with title-page and paper covers, but without repaging.

This report gives results of observations in Colorado, Utah, and Wyoming. The existence of the Green River and Bridger groups south of the Uinta Mountains is first announced in this report; and descriptions of three species of fossils are given in foot-notes.

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71.

WHITE, C. A. Paleontological Papers No. 9: Fossils of the Jura-Trias of Southeastern Idaho. <Bulletin U. S. Geol. and Geog. Surv. of the Terr., vol. v, art. v, pp. 105–117. Washington, 1879.

Same. Washington: Government Printing Office, 1879. 8vo, pp. 105–117. Two hundred separates printed (author's edition) without repaging, but with title-page, and in paper covers, together with Paleontological Papers No. 10.

Ten species are described, most of which are new; and the genus *Meekoceras*, Hyatt, is described for the first time in this article.

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72.

WHITE, C. A. Paleontological Papers No. 10. Conditions of Preservation of Invertebrate Fossils. <Bulletin U. S. Geol. and Geog. Surv. of the Terr. Vol. v, art. viii, pp. 133–141. Washington, 1879.

Same. Washington: Government Printing Office, 1879. 8vo., pp. 133–141. Two hundred separates printed (author's edition) without repaging, but with title page and with paper covers, together with Paleontological Papers No. 9.

The fact is pointed out that shells of different classes and families which have been fossilized under the same conditions are differently preserved.

73.

WHITE, C. A. Paleontological Papers No. 11. Remarks upon Certain Carboniferous Fossils from Colorado, Arizona, Idaho, Utah, and Wyoming, and Certain Cretaceous Corals from Colorado, together with Descriptions of New Forms. <Bulletin U. S. Geol. and Geog. Surv. of the Terr. Vol. v, art. xiv, pp. 209–221. Washington, 1879.

Same. Washington: Government Printing Office, 1879. 8vo., pp. 209–221. Two hundred separates printed (author's edition) without repaging, but with title-page and paper covers. The series of Paleontological Papers closes with this number.

Thirteen species are described, most of which are new. Attention is called to the commingling of Upper and Lower Carboniferous types in the Carboniferous strata of the western portion of North America.

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74.

WHITE, C. A., and NICHOLSON, H. A. Supplement to the Bibliography of North American Invertebrate Paleontology. <Bulletin U. S. Geol. and Geog. Surv. of the Terr., vol. v, pp. 143–152. Washington, 1879.

Same. Washington: Government Printing Office, 1879, pp. 143–152. Two hundred separates printed (author's edition) with title-page and paper covers, but without repaging.

This supplement embraces works which were published after the publication of the Bibliography, besides some that were inadvertently omitted then.

Part I. Publications made in the United States. By C. A. White, pp. 143–149.

Part II. Publications made in British North America, the West Indies, and Europe. By H. Alleyne Nicholson, pp. 150–152.

75.

WHITE, C. A. Paleontology: Fossils of the Indiana Rocks. < State of Indiana. Second Annual Report of the Department of Statistics and Geology, 471–522, pls. i–xi. Indianapolis, 1880.

Same. In Indiana Geological Report, 1879–'80. From the Second Annual Report of the Bureau of Statistics and Geology. John Collett, Chief of Department. Indianapolis, 1881. 8vo. pp. 103–154, and 11 plates.

This book is an extract of the geological and biological matter from the volume of the preceding entry, repaged and bound in cloth, with new title-page as above.

This work is designed for popular use, and, with the exception of one variety, none of the species described and figured are new. The illustrations are also largely copies of formerly published figures. Forty-nine species of characteristic Silurian, Devonian, and Carboniferous forms are given.

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76.

WHITE, C. A. Progress of Invertebrate Paleontology in the United States for t year 1879. <Amer. Nat. vol. xiv, pp. 250–260. Philadelphia, 1880.

Same. Philadelphia, 1880, 8vo, pp. 250–260. One hundred separates printed witho title-page, covers, or repaging.

This article, like those for the years 1880, 1881, and 1882, respectively, is a list of the ti of the works published within the year designated, together with remarks upon them.

77.

WHITE, C. A. On the Antiquity of Certain Subordinate Types of Fresh-water a Land Mollusca. <Amer. Jour. Sci., 3d ser., vol. xx, pp. 44–49. New Haven, 18

Same. New Haven, 1880, 8vo, pp. 44–49. Twenty separates printed without tit page, covers, or repaging.

It is shown that not only were many of the genera of living North American Mollusca tablished as early as the close of the Cretaceous period, but many of the subgenera w established thus early also.

78.

WHITE, C. A. Descriptions of new species of Carboniferous Invertebrate Fossi <Proc. U. S. Nat. Mus., vol. ii, pp. 252–260, one plate. Washington, 1880.

Same. Washington: Government Printing Office, 1879, 8vo, pp. 252–260, one pla One hundred and fifty separates printed without title-page, covers, or repagi

Six species of Echinoderms are described, and the genus *Lecythiocrinus* is proposed.

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79.

WHITE, C. A. Note on Endothyra ornata. <Proc. U. S. Nat. Mus., vol. ii, p. 2 Washington, 1880.

Same. Washington: Government Printing Office, 1879, 8vo, p. 291. One hundı and fifty separates printed, together with the papers of the two following entri without title-page, covers, or repaging.

The discovery of that foraminiferous form in the Carboniferous rocks of Wyoming is notic It was previously known only in Europe.

80.

WHITE, C. A. Note on Criocardium and Ethmocardium. <Proc. U. S. Nat. Mu vol. ii, pp. 291–292. Washington, 1880.

Same. Washington: Government Printing Office, 1879, 8vo, pp. 291–292. One hu dred and fifty separates printed, together with the papers of the preceding a the following entry, without title-page, covers, or repaging.

The new genus *Ethmocardium* is proposed.

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* Ληκύθιον, a small oil flask.

81.

WHITE, C. A. Descriptions of new Cretaceous Invertebrate Fossils from Kansas and Texas. <Proc. U. S. Nat. Mus., vol. ii, pp. 292–298, pls. i–v. Washington, 1880.

Same. Washington: Government Printing Office, 1879, 8vo, pp. 292–298, and five plates. One hundred and fifty separates printed, together with the papers of the two preceding entries, without title-page, covers, or repaging.

Six species are described as new and illustrated.

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82.

WHITE, C. A. Report on the Carboniferous Invertebrate Fossils of New Mexico. <Report upon U. S. Geog. and Geol. Surveys West of the 100th Meridian; in charge of Capt. George M. Wheeler, Corps of Engineers, U. S. Army. 4to., vol. iii; Supplement. Geology. Appendix, pp. I–xxxviii, pl. i–ii. Washington, 1881.

Same. Washington: Government Printing Office, 1881, 4to, pp. I–xxxviii, and two plates. Seventy-five separates printed, without title-page, covers, or repaging.

This report embraces an annotated catalogue of the species collected at each locality, and also descriptions of seventeen species, a part of which are new.

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A. ? stevensoni, n. s., White, 1881, pl. iii, figs. 9 *a, b*	xxxv–xxxvi

83.

WHITE, C. A. Progress of Invertebrate Paleontology in the United States for the year 1880. <Amer. Nat., vol. xvi, pp. 273–279. Philadelphia, 1881.

Same. Philadelphia, 1881, 8vo, pp. 273–279. One hundred separates printed without title-page, covers, or repaging.

This article is similar to that of entry No. 74.

84.

WHITE, C. A. English Sparrows refusing to eat worms. <Amer. Nat., vol. xv, pp. 671–672. Philadelphia, 1881.

It is observed that the sparrows refused to eat earth worms, which are favorite food with other birds, when they come to the surface after rains.

85.

WHITE, C. A. Note on the occurrence of Productus giganteus in California. <Proc. U. S. Nat. Mus., vol. iii, pp. 46–47, pl. i. Washington, 1881.

Same. Washington: Government Printing Office, 1880. 8vo, pp. 46–47, and one plate. One hundred and fifty separates printed, together with the papers of the two following entries, without title-page, covers, or repaging.

The volume was first distributed without the plate; but the latter was afterward printed and distributed.

86.

WHITE, C. A. Note on Acrothele. <Proc. U. S. Nat. Mus., vol. iii, p. 47. Washington, 1881.

Same. Washington: Government Printing Office, 1880, 8vo, p. 47. One hundred and fifty separates printed, together with the last, and the next following entry.

It is shown that *Acrotreta subsidua*, White, from Southern Utah, really belongs to the genus *Acrothele*, Linnarsson.

87.

WHITE, C. A. Description of a new Cretaceous Pinna from New Mexico. <Proc. U. S. Nat. Mus., vol. iii, pp. 47–48. Washington, 1881.

Same. Washington: Government Printing Office, 1880, 8vo, pp. 47–48. One hundred and fifty separates printed, together with the papers of the two preceding entries, without-title page, covers, or repaging.

The author now thinks that the proposed new species (*Pinna stevensoni*) is only a variety of *P. petrina*, White.

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Pinna stevensoni, n. s., White, 1880	47–48

88.

WHITE, C. A. Note on the occurrence of Stricklandinia salteri and S. davidsoni in Georgia. <Proc. U. S. Nat. Mus., vol. iii, pp. 48–49. Washington, 1881.

Same. Washington: Government Printing Office, 1880, 8vo, pp. 48–49. One hundred and fifty separates printed without title-page, covers, or repaging.

89.

WHITE, C. A. Description of a very large fossil Gasteropod from the State of Puebla, Mexico. <Proc. U. S. Nat. Mus., vol. iii, pp. 140–142, and one plate. Washington, 1881.

Same. Washington: Government Printing Office, 1880, 8vo, pp. 140–142, and one plate. One hundred and fifty separates printed without title-page, covers, or repaging.

The species described is from strata believed to be of Cretaceous age.

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T. princeps, n. s., White, 1880, pl. ii, figs. 1 and 2	141–142

90.

WHITE, C. A. Descriptions of new Invertebrate fossils from the Mesozoic and Cenozoic rocks of Arkansas, Wyoming, Colorado, and Utah. <Proc. U. S. Nat. Mus., vol. iii, pp. 157–162. Washington, 1881.

Same. Washington: Government Printing Office, 1880, 8vo, pp. 157–162. One hundred and fifty separates printed without title-page, covers, or repaging.

Nine species are described as new; but none are illustrated.

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91.

WHITE, C. A. [Review of] A. G. Wetherby: Description of new fossils from the Lower Silurian and Subcarboniferous rocks of Ohio and Kentucky. (Journ. Cincinnati Soc. Nat. History, vol. iv, no. 1 [April, 1881], pp. 77–85, pl. ii.) <Neues Jahrbuch für Mineralogie, Geologie, und Palæontologie, ii Band, p. 408. Stuttgart, 1881.

92.

WHITE, C. A. [Review of] A. G. Wetherby: Description of new fossils from the Lower Silurian and Subcarboniferous rocks of Kentucky. (Journ. Cincinnati Soc. Nat. History, vol. iv, no. 2 [July, 1881], pp. 177–179, pl. v.) <Neues Jahrbuch für Mineralogie, Geologie, und Palæontologie, ii Band, p. 408. Stuttgart, 1881.

93.

WHITE, C. A. [Review of] S. A. Miller: New species of fossils and remarks others from the Niagara Group of Illinois. (Journ. Cincinnati Soc. Nat. Hi vol. iv, no. 2 [July, 1881], pp. 166–176, pl. iv.) < Neues Jahrbuch für Mi ogie, Geologie, und Palæontologie. ii Band, p. 408. Stuttgart, 1881.

94.

WHITE, C. A. Fossils of the Indiana rocks, No. 2. < Indiana, Department of ogy and Natural History, Eleventh Annual Report. John Collet, State gist, 1881; pp. 347–401, pls. xxxvii–lv. Indianapolis, 1882.

Same. Indianapolis, 1882; 8vo, pp. 347–401, with 19 plates and the index for the volume. Fifty separates printed without title-page or repaging, and without

The object oft his memoir, like that of entry No. 75, is largely that of popular instr The greater part of the species here described and figured are republished from the w other authors, only four of the species being new. Twelve of the plates are devoted to of fossil corals, which figures were engraved many years ago by J. W. Van Cleve, to pany a work on fossil corals by himself, which he did not live to publish or to finish. are 29 species of these corals here described and figured, besides 20 other species, a Paleozoic rocks.

Description of fossils.

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    G. elrodi, n s., White, 1882, pl. xxxvii, fig. 1, and pl. xxxviii, figs. 2–4..............
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    O. annulatum, Sowerby, 1818, pl. xxxviii, fig. 1........

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    Bellerophon, Montfort........
    B. sublævis, Hall, 1858, pl. xl, figs. 5–7........
    B. gibsoni, n. s., White, 1882, pl. xli, figs. 4–6........
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    Terebratula, Llhwyd........
    T. formosa, Hall, 1858, pl. xxxix, figs. 6–8........
  Bryozoa.
    Archimedes, Lesueur........
    A. laxa, Hall, 1857, pl. xli, fig. 7........
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  Echinodermata.
    Lepidesthes, M. & W........
    L. colletti, White, 1878, pl. xli, figs. 2 and 3........
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    A. springeri, n. s., White, 1882, pl. xl, figs. 2–4........
    Onychocrinus, Lyon & Casseday ..
    O. exsculptus, Lyon & Casseday, 1860, pl. xl, fig. 1 ....
    O. ramulosus, Lyon & Casseday, 1859, pl. xxxix, figs. 2 and 3 ....
    Cyathocrinus, Miller........
    C. multibrachiatus, Lyon & Casseday, 1859, pl. xxxix, fig. 1........
    Platycrinus, Miller........
    P. hemisphericus, M. & W., 1865, pl. xli, fig. 1........
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  Porifera.
    Palæacis, Haime........
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P. nitidula, M. & W., pl. xlii, figs. 7 and 8 370–371

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95.

WHITE, C. A. Progress of Invertebrate Paleontology in the United States for the year 1881. <American Naturalist, vol. xvi, pp. 887–891. Philadelphia, 1882.

Same. Philadelphia, 1882. 8vo, pp. 887–891. One hundred separates printed without title page, covers, or repaging.

This article is similar to those of entries 74 and 81.

96.

WHITE, C. A. Artesian Wells upon the Great Plains. <North American Review, vol. 135, pp. 187–195. New York, 1882.

Same. New York, 1882. 8vo, 9 pages. Fifty separates printed without title-page or covers, but repaged.

This article gives some results of the examination of the region of Eastern Colorado by a commission appointed by the U. S. Commissioner of Agriculture, of which the author was chief.

97.

WHITE, C. A. Tanganyika Shells. <Nature, 4to, vol. xxv, pp. 101–102. London and New York, 1882.

This note suggests the probable identity of *Paramelania* Smith, a proposed molluscan subgenus now living in Lake Tanganyika, Africa, with the fossil genus *Pyrgulifera* Meek, from the Laramie Group of Southwestern Wyoming.

98.

WHITE, C. A. On certain conditions attending the geological descent of some North American types of fresh-water gill-bearing Mollusks. <Amer. Jour. Sci., 3d ser., vol. xxiii, pp. 382–386. New Haven, 1882.

Same. New Haven, 1882. 8vo, pp. 382–386. Twenty separates printed without title-page, covers, or repaging.

The substance, not the words, of this article is an extract from parts of an illustrated work, the title of which is given in entry No. 105. The opinion is advanced that the present gill-bearing fauna of the Mississippi River system has been derived in part from the Laramie sea and the fresh-water lakes which succeeded it, by means of the persistence of their outlets as rivers, down to the present time.

99.

White, C. A. Artesian Wells upon the Great Plains; being the report of a geological commission appointed to examine a portion of the Great Plains east of the Rocky Mountains, and report upon the localities deemed most favorable for making experimental borings. Department of Agriculture, pp. 1–38, pl. i. Washington, 1882.

The map is a copy of part of sheet xi of the atlas of Colorado, published by the United States Geological Survey of the Territories.

100.

White, C. A. On certain Cretaceous fossils from Arkansas and Colorado. <Proc. U. S. National Museum, vol. iv, pp. 136–139, pl. i. Washington, 1882.

Same. Washington, Government Printing Office, 1882. 8vo, pp. 136–139, and one plate. One hundred and fifty separates printed without title-page, covers, or repaging.

Six species are described and figured, two of which are new.

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Callianassa ulrichi, White, 1880, pl. i, figs. 10 and 11	137
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Lucina profunda, White, 1880, pl. i, figs. 5 and 6	138
Lucina cleburni, n. s., White, 1882, pl. i, figs. 3 and 4	139
Solemya bilix, White, 1880, pl. i, fig. 9	139
Pteria (Oxytoma) erecta, White, 1880, pl. i, figs. 7 and 8	139

101.

White, C. A. [Review of] S. A. Miller: Description of some new and remarkable crinoids and other fossils of the Hudson River Group, and notice of Strotocrinus bloomfieldensis. (Journ. Cincinnati Soc. Nat. History. Vol. iv, No. 1 [April, 1881], pp. 69–77, pl. i.) <Neues Jahrbuch für Mineralogie, Geologie, und Paläontologie. I Band, p. 307. Stuttgart, 1881.

102.

White, C. A. [Review of] Henry Newton, E. M., and Walter P. Jenney, E. M.: Report on the Geology and resources of the Black Hills of Dakota. 4to, pp. 1–555, with Atlas. Washington, 1880. <Neues Jahrbuch für Mineralogie, Geologie, und Paläontologie. II Band, pp. 216–218. Stuttgart, 1882.

103.

White, C. A. [Review of] United States Geological Survey: Annual Report for 1881 of J. W. Powell, Director. Imperial 8vo, pp. 1–558, lxi plates, and 32 woodcuts. Washington, 1882. <Neues Jahrbuch für Mineralogie, Geologie, und Paläontologie. II Band, pp. 365–366. Stuttgart, 1882.

104.

White, C. A. Contributions to Invertebrate Paleontology, No. 2: Cretaceous fossils from the Western States and Territories. <Twelfth Annual Report of the United States Geological and Geographical Survey of the Territories (for the year 1878). pp. 1–38; appendix, pp. 38, 39, pls. xi–xviii. Washington, 1883.

Same. Washington: Government Printing Office, 1880. 8vo, pp. 1–39, and plates 11–18. Two hundred separates printed (author's edition) without repaging, but with title-page and covers, together with Contributions to Invertebrate Paleontology, Nos. 3, 4, 5, 6, 7, and 8. In 1883 100 additional copies of the same were printed in the same form. The title-page in both these cases differs from the title which heads the text by the omission of the word "Invertebrate."

Thirty-seven species are described and figured, five of which are new. On plate xviii ten species are also illustrated which were originally published by Dr. Shumard, but were never before illustrated.

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- *Chætetes* Fischer 7
- *C. ? ? dimissus*, White, 1879, pl. xii, fig. 14 *a* 7
- *Beaumontia*, Edwards & Haime 8
- *B. ? solitaria*, n. s., White, 1880, pl. xii, figs. 13 *a–c* 8

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- *Ophioderma* 8
- *O. ? bridgerensis*, Meek, 1873, pl. xii, fig. 12 *a* 8–9

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- *O. soleniscus*, Meek, 1873, pl. xi, figs. 2 *a*, *b* 9–10
- *O. anomioides*, Meek, 1873, pl. xi, figs. 4 *a*, *b* 10–11
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- *B. barbulata*, n. s., White, 1880, pl. xi, fig. 5 *a* 19
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- *C. carletoni*, Meek, 1873, pl. xii, figs. 16 *a*, *b* 20–21
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- *Neritina*, Lamarck 25
- *N. bannisteri*, Meek, 1873, pl. xii, figs. 10 *a–c* 25–26
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105.

WHITE, C. A. Contributions to Invertebrate Paleontology No. 3.—Certain Tertiary Mollusca from Colorado, Utah, and Wyoming. <Twelfth Annual Report of the U. S. Geol. and Geog. Surv. of the Terr. (for the year 1878), pp. 41–48, and pl. xix. Washington, 1883.

Same. Washington, Government Printing Office, 1880. 8vo, pp. 41–48, and pl. xix. Three hundred separates printed. See remarks following entry No. 104.

Ten species are described and figured, one of which is new.

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U. washakiensis, Meek, 1871, pl. xix, figs. 3 *a*, *b*	42–43
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WHITE, C. A. Contributions to Invertebrate Paleontology No. 4.—Fossils of the Laramie Group. <Twelfth Annual Report of the U. S. Geol. and Geog. Surv. of the Terr. (for the year 1878), pp. 49–103, and pls. xx–xxx. Washington, 1883.

Same. Washington, Government Printing Office, 1880. 8vo, pp. 49–103, and pls. xx–xxx. Three hundred separates printed. See remarks following entry No. 104.

The object of this article is to give a list of all the mollusca that were known from the Laramie Group up to the time of publication, and to illustrate those which had not before been illustrated.

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White, C. A. Contributions to Invertebrate Paleontology, No. 5. Triassic Fossils of Southeastern Idaho. <Twelfth Annual Report U. S. Geol. and Geog. Surv. of the Terr. (for the year 1878), pp. 105–118, pls. xxxi–xxxii. Washington, 1883.

Same. Washington: Government Printing Office, 1880, 8vo, pp. 105–118, pls. xxxi–xxxii. Three hundred separates printed. See remarks following entry No. 93.

This article is essentially a republication of Paleontological paper No. 9. (See entry No. 71.)

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WHITE, C. A. Contributions to Invertebrate Paleontology, No. 6.—Certain Carboniferous Fossils from the Western States and Territories. <Twelfth Annual Report U. S. Geol. and Geog. Surv. of the Terr. (for the year 1878), pp. 119–141, and pls. xxxiii–xxxvi. Washington, 1883.

Same. Washington: Government Printing Office, 1883. 8vo, pp. 119–141, and pls. xxxiii–xxxvi. Three hundred separates printed. See remarks following entry No. 104.

Twenty-seven species of fossils are described and illustrated, all of which had been previously published.

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WHITE, C. A. Contributions to Invertebrate Paleontology No. 7. Jurassic Fossils from the Western Territories. <Twelfth Annual Report of the U. S. Geol. and Geog. Surv. of the Terr. (for the year 1878), pp. 143–153, pls. xxxvii–xxxviii. Washington, 1883.

Same. Washngton: Government Printing Office, 1880. 8vo, pp. 143–153, and plates xxxvii–xxxviii. Three hundred separates printed. See remarks following entry No. 93.

Sixteen species are described and figured, part of which are new, and the genus Lyosoma is diagnosed.

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WHITE, C. A. Contributions to Invertebrate Paleontology No. 8. Fossils from the Carboniferous Rocks of the Interior States. <Twelfth Annual Report of the U. S. Geol. and Geog. Surv. of the Terr. (for the year 1878). pp. 155–171, pls. xxxix–xlii. Washington, 1883.

Same. Washington: Government Printing Office, 1880. 8vo, pp. 155–171, and plates xxxix–xlii. Three hundred separates printed. See remarks following entry No. 93. The series of contributions closes with No. 8, and it is not again resumed in that form.

Twenty-eight species are described and figured, part of which are new.

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* λυω, to loosen, and σωμα, the body.

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111.

White, C. A. Forestry in the Great Prairie Region. <American Journal of Forestry, vol. i (May No.), pp. 366–370. Cincinnati, 1883.

Same. Cincinnati, 1883. 8vo, pp. 1–6. Forty separates printed without title-page, or covers, but repaged.

This Journal was started at the beginning of 1883, with Dr. F. B. Hough as editor and Robert Clarke & Co. as publishers. It was published one year and then discontinued.

112.

White, C. A. The reversion of Sunflowers at night. <Nature. 4to, vol. [xxvii?] p. 241. London and New York, 1883.

Sunflowers are observed to turn to the eastward immediately after dark.

113.

White, C. A. New Molluscan forms from the Laramie and Green River groups; with discussion of some associated forms heretofore known. <Proc. U. S. National Museum, vol. v, pp. 94–99, pls. i–ii. Washington, 1883.

Same. Washington: Government Printing Office, 1882. 8vo, pp. 94–99, and two plates. One hundred and fifty separates printed, together with the paper of the next entry, without title-page, covers, or repaging.

Six species are described and figured as new; and *Paramelania*, Smith, is figured and compared with *Pyrgulifera*, Meek. Also the discovery of the under valve of *Anomia micronema* is announced and figured; and the prismatic structure of that valve suggested as the cause that it has so generally been destroyed.

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White, C. A. The Molluscan Fauna of the Truckee Group, including a new form. <Proc. U. S. National Museum, vol. v, pp. 99–101, pl. i. Washington, 1883.

Same. Washington: Government Printing Office, 1882. 8vo, pp. 99–101, and one plate. One hundred and fifty separates printed, together with the paper of the last entry, without title-page, covers, or repaging.

Nine species are figured, which constitute the entire molluscan fauna of the Truckee Group as it was then known to the author. A species of *Latia* is described, which is the only one of that genus yet known in North America.

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WHITE, C. A. A Review of the Non-Marine Fossil Mollusca of North America. <Third Annual Report of the Director of the United States Geological Survey to the Secretary of the Interior, 1881-'82. By J. W. Powell, Director, pp. 403-550 and pls. p. i-xxxii. Washington, 1883.

Same. Washington: Government Printing Office, 1883. Imp. 8vo, pp. 1-80 and pls. 1-32. One hundred copies printed early in 1883 with paging, numbering of the plates, and title-page separate from that of the volume.

Same. One hundred more copies printed at the time of the issuance of the volume in 1884.

This memoir contains a discussion of the families which are represented in the brackish and fresh water deposits, an annotated catalogue of all the known species in the order in which the formations occur. general discussion of the conditions which prevailed when the mollusks lived, and the manner in which the lines of descent of a part of them have been continued to the present time. Two hundred and twenty-seven species are noticed, all of which are illustrated. Although the volume of which this work is an extract, bears the date 1883 upon its title-page, the volume, as a whole, was not issued until near the middle of 1884.

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116.

WHITE, C. A. Progress of Invertebrate Paleontology in the United States for the year 1882. <Amer. Nat., vol. xvii, pp. 598-603. Philadelphia, 1883.

Same. Philadelphia, 1883. 8vo, pp. 598-603. One hundred separates printed without title-page, covers, or repaging.

This series of articles, which was begun for the year 1879, was discontinued with this article; but the series is continued by Mr. J. B. Marcou.

117.

WHITE, C. A. Glacial Drift in the Upper Missouri River Region. <Amer. Jour. Sci., 3d ser., vol. xxv, p. 206. New Haven, 1883.

Same. New Haven, 1883. 8vo, p. 206. Twenty separates printed without title-page, covers, or repaging.

The existence of true northern glacial drift in the region of the mouth of the Yellowstone River is announced.

118.

WHITE, C. A. Late observations concerning the Molluscan Fauna and the Geographical extent of the Laramie Group. <Amer. Jour. Sci., 3d ser., vol. xxv, pp. 207-209. New Haven, 1883.

Same. New Haven, 1883. 8vo, pp. 207-209. Twenty separates printed without title-page, covers, or repaging.

The discovery of Laramie fossils in the State of Nuevo Leon, Mexico, and in the Saskatchewan Valley, British America, is announced.

119.

WHITE, C. A. On the existence of a deposit in Northeastern Montana and Northwestern Dakota, that is possibly equivalent with the Green River Group. <Amer. Jour. Sci., 3d ser., vol. xxv, pp 411-416. New Haven, 1883.

Same. New Haven, 1883. 8vo, pp. 411-416. Twenty separates printed without title-page, covers, or repaging.

Some teleost fish remains were obtained from certain layers which rest comformably upon the top of the Laramie Group. On pages 414-416 of this article Prof. E. D. Cope describes a new genus of fishes and two species.

120.

WHITE, C. A. The burning of Lignite in situ. <Amer. Jour. Sci., 3d ser., vol. xxvi, pp. 24-26. New Haven, 1883.

Same. New Haven, 1883. 8vo, pp. 24-26. Twenty separates printed without title-page, covers, or repaging.

The opinion is advanced that the burning of the beds of lignite of the Laramie Group has been mainly the result of spontaneous ignition, and that these fires probably began as early as the later Tertiary and before the advent of man.

121.

WHITE, C. A. On the commingling of ancient faunal and modern floral types in the Laramie Group. <Amer. Journ. Sci., 3d ser., vol. xxvi, pp. 120-123. New Haven, 1883.

Same. New Haven, 1883. 8vo, pp. 120-123. Twenty separates printed without title-page, covers, or repaging.

It is shown that well-known species of Miocene plants are found associated with Dinosaurs and characteristic Laramie mollusks.

122.

White, C. A. [Administrative report for the year 1882–'83] < Fourth Annual Report of the Director of the United States Geological Survey, pp. 42–44. Washington, 1883.

123.

White, C. A. A review of the Fossil Ostreidæ of North America; and a comparison of the fossil with the living forms. <Fourth Annual Report of the Director of the United States Geological Survey. pp. 281–333, and pls. xxxiv–lxxvi. Washington, 1883.

Same. Washington: Government Printing Office, 1883. Imp. 8vo, pp. 281–333, and pls. xxxiv–lxxvi. One hundred separates printed with paper covers and title-page, but without repaging.

This work is an annotated catalogue of the species. It contains two appendices, by Prof. A. Heilprin and Mr John A. Ryder, respectively. The former is on the North American Tertiary *Ostreidæ*. pp. 309–316, and pls. lxii–lxxii. The latter is a sketch of the life-history of the oyster. pp. 317–333, and pls. lxxiii–lxxvi.

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White, C. A. [Annual report to the director of the National Museum.] <Report of the Assistant Director of the U. S. National Museum, G. Brown Goode, for the year 1882. pp. 31–32. Washington, 1883.

A portion of Dr. White's statements and recommendations are quoted.

136.

White, C. A. On the Macrocheilus of Phillips, Plectostylus of Conrad, and Soleniscus of Meek & Worthen. <Proc. U. S. National Museum, vol. vi, pp. 184–187, pl. viii. Washington, 1884.

Same. Washington: Government Printing Office, 1884, 8vo, pp. 184–187, pl. viii. One hundred and fifty separates printed without title-page, covers, or repaging.

Many of the Carboniferous species which have hitherto been referred by authors to *Macrocheilus* are herein referred to *Soleniscus*.

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White, C. A. On the character and function of the epiglottis in the Bull snake (Pityophis). <Amer. Nat., vol. xviii, pp. 19–21. Philadelphia, 1884.

Same. Philadelphia, 1884, 8vo, pp. 19–21. Fifty separates, printed without title-page, covers, or repaging.

It is shown that the hoarse hiss of this snake is produced by the fluttering of the thin erect epiglottis in the current of air expelled from the rima glottidis.

138.

White, C. A. The permanence of the domestic instinct in the cat. <Amer. Nat., vol. xviii, pp. 213–214. Philadelphia, 1884.

Same. Philadelphia, 1884, 8vo, pp. 213–214. Fifty separates printed without title-page, covers, or repaging.

A story of a cat which had spent a year alone in the wilderness of the Upper Missouri.

139.

White, C. A. Glacial drift in Montana and Dakota. <Amer. Jour. Sci. 3d ser., vol. xxvii, pp. 112–113. New Haven, 1884.

Same. New Haven, 1884, 8vo 3d ser., vol. xxvii, pp. 112–113. Twenty separates printed without title-page, covers, or repaging.

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140.

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White, C. A. On the Nautiloid genus Enclimatoceras Hyatt, and a description of the type species. <Bull. of the U. S. Geol. Surv. No. 4. On Mesozoic fossils. pp. 16 (104)–17 (105), pls. vii–ix. Washington, 1884.

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143.

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The view is held that the prairie soil is well adapted to the growth of forest trees; and that the prairies are such only because their occupation by forests has not been accomplished by the natural distribution of trees; also that such distribution has long been retarded by prairie fires.

144.

White, C. A. Enemies and parasites of the oyster, past and present. <Science, 4to, vol. iii, p. 618. Cambridge, 1884.

It is shown that *Cliona* or a similar burrowing sponge infested certain *Brachiopod* shells as early as the Devonian, and that they were as common upon the fossil *Ostreidæ* as upon the living. Also that remains of star fishes are rarely found with fossil *Ostreidæ*, although they are so common an enemy to living oysters.

145.

White, C. A. Certain phases in the geological history of the North American Continent, biologically considered. <Proceedings of the Washington Biological Society. vol. ii, pp. 41–66. Washington, 1884.

Same. One hundred separates printed with paper covers, title-page, and repaging.

Address as retiring president of the Biological Society of Washington.

146.

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This paper contains some elementary remarks and description of three new species, but it is mainly devoted to the republication of well-known forms.

Same. Indianapolis, 1884, pp. —. Fifteen separates printed.

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Belemnites densus, M. & H	229
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WHITE, C. A. The Genus Pyrgulifera, Meek, and its Associates and Congeners. <Amer. Jour. Sci., 3d ser., vol. xxix, pp. 277–280. New Haven, 1885.

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The second on "Fossil Mollusca, from the John Day group in Eastern Oregon," pp. 10–16.

The following new species are described:

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WHITE, C. A. On new Cretaceous Fossils from California. <Bull. U. S. Geol. Surv., No. 22, pp. 1 (349);–15 (361), pls. i–v. Washington, 1885.

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Besides the foregoing, Dr. White has in press an important work on the Cretaceous invertebrates of Brazil, which were collected by the Imperial Geological Commission under the direction of the late Prof. Ch. Fred. Hartt. The work is in process of publication at Rio de Janeiro by the Brazilian National Museum. It is to appear in Volume VII of the "Archives" of that museum, in both the Portuguese and English languages, and will be illustrated with 28 lithographic plates of figures.

The work consists of five parts, which are as follows in the original Portuguese edition—

Contribuiçœs para a Palæontologia do Brazil:

No. 1. Conchiferos Cretaceos.
No. 2. Gasteropodes Cretaceos.
No. 3. Cephalopodes Cretaceos.
No. 4. Molluscos Cretaceos de Agua doce do Grupo da Bahia.
No. 5. Echinodermes Cretaceos.

Two hundred and fourteen species in all are published and figured in this work, of which 116 species are diagnosed as new. Four new genera are proposed, three of gasteropoda and one of echinoids. The former are *Orvillia*, *Cylindritella*, and *Cypræactæon*. The latter is *Heteropoda*, the generic diagnosis of which was furnished to the author by Prof. P. de Loriol, of Geneva.

PART III.

THE PUBLISHED WRITINGS OF CHARLES DOOLITTLE WALCOTT.

III.—PUBLISHED WRITINGS OF CHARLES DOOLITTLE WALCOTT.

1.

WALCOTT, C. D. Description of a New Species of Trilobite. <Cincinnati Quarterly Journal of Science, vol. ii, pp. 273–274, figs. 18 *a*, *b*. July. Cincinnati, 1875.

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WALCOTT, C. D. Notes on Ceraurus pleurexanthemus, Green. <Annals Lyc. Nat. Hist. N. Y., vol. xi, pp. 155–162, pl. xi. November. New York, 1875.

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WALCOTT, C. D. Preliminary Notice of the Discovery of the Remains of the Natatory and Branchial appendages of Trilobites. <28th Regent's Report N. Y. State Mus. Nat. Hist., pp. 89–92. 1877. Albany, 1879.

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WALCOTT, C. D. Notes on some Sections of Trilobites from the Trenton limestone, [and] Note upon the Legs of Trilobites. <31st Regent's Report N. Y. State Mus. Nat. Hist., pp. 61–65, pl. i. Albany, 1879.

Published in advance, September 20, 1877, pp. 1–17, pl. i.
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* κογχη, shell; πελτη, shield.

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WALCOTT, C. D. Note upon the Eggs of the Trilobite. <31st Regent's Report N. Y. State Mus. Nat. Hist., pp. 66–67? Albany, 1879.

Published in advance, September 20, 1877, pp. 11–13.

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* Κύαθος, a cup; φῦκος, a weed.

† Δισκος, a disk; φῦκος, a sea-weed.

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WALCOTT, C. D.—On the Cambrian Faunas of North America; Preliminary studies. <Bull. U. S. Geol. Surv. No. 10, pp. 1–74, pl. i–x. Washington, 1884.

This contains three parts. The first is a "Review of the fauna of the Saint John formation, contained in the Hartt collection." Mr. Matthew proposed the specific names for the new species excepting for one, *Harttia matthewi*, the type of the n. g. *Harttia*, Walcott. The author does not accept the genus *Conocephalites* and refers its different species to some of *Ptychoparia* and one of *Conocoryphe*. The following species are mentioned:

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27.

WALCOTT, C. D. Note on some Paleozoic Pteropods. <Amer. Journ. Sci., 3d ser., vol. xxx, July, pp. 17-21, figs. 1-6. New Haven, 1885.

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4.

Conrad, T. A. Report on the fossil shells collected in California by William P. Blake, geologist of the expedition under the command of Lieut. R. S. Williamson, United States Topographical Engineers. <Reports of Explorations and Surveys from the Mississippi River to the Pacific Ocean. Appendix to the Preliminary Geological Report of William P. Blake. Paleontology article I, pp. 5–20, 8vo, House Document 129, Washington (1855).

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Conrad, T. A. Check list of the Invertebrate Fossils of North America. Eocene and Oligocene. <Smithsonian miscellaneous collections, 200 pp., i–iv, and 1–41. Washington, 1866.

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12.

CONRAD, T. A. [Description of a new genus and subgenus.] <Rep. U. S. Geol. and Geogr. Surv. Terr., F. V. Hayden, vol. ii. The vertebrata of the Cretaceous formations of the West by E. D. Cope, pp. 23-24. Washington, 1875.

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III.—THE WRITINGS OF JAMES DWIGHT DANA.

1.

Dana, J. D. Zoophytes. <U. S. Expl. Exp. during the years 1838–1842 under the command of Charles Wilkes, U. S. N., vol. vii, pp. 1–741, Atlas pls. i–lxi. Philadelphia, 1846.

Many fossil genera are mentioned and discussed in this work.

2.

Dana, J. D. Genera of Fossil Corals of the family Cyathophyllidæ. <Amer. Journ. Sci., 2d ser., vol. i, pp. 178–189, figs. 1–5. New Haven, 1846.

This article is extracted from the report of the United States Exploring Expedition during the years 1838–'42, under the command of Charles Wilkes, U. S. N. Zoophytes, by James D. Dana, Geologist of the Expedition, pp. 1–741. 4to. See entry No. 1.

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3.

Dana, J. D. Description of Fossil Shells of the collections of the Exploring Expedition under the command of Charles Wilkes, U. S. N., obtained in Australia, from the lower layers of the coal formation in Illawara, and from a deposit probably of nearly the same age at Harper's Hill, valley of the Hunter. <Amer. Journ. Sci., 2d ser., vol. iv. Appendix, pp. 151–160. New Haven, 1847.

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4.

DANA, J. D. Fossils of the Exploring Expedition under the command of Charles Wilkes, U. S. N., a fossil fish from Australia, and a Belemnite from Terra Del Fuego. <Am. Journ. Sci., vol. v, 2d ser., pp. 433–435. New Haven, 1848.

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DANA, J. D. Descriptions of fossils. <U. S. Expl. Exp., 1838–'42, under the command of Charles Wilkes, U. S. N. Geology. By James D. Dana. Vol. x, Appendix, pp. 681–729, *pars*. Atlas, xxi, pls. *pars*. Philadelphia, 1849.

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1.

EHRENBERG, C. G. On Infusorial Deposits on the River Chutes in Oregon. Amer. Jour. Sci., 2d ser., Vol. IX, p. 140. New Haven, 1850.

A brief notice of the author's work in the Monatsb. Akad., Berlin, February, 1849, p. 76.

2.

EHRENBERG, C. G. Über das mächtigste bis jetzt bekannt gewordene (angeblich 500 Fuss mächtige) Lager von mikroskopischen reinen kieselschaligen Süsswasser-Formen am Wasserfall-Flusse im Oregon. <Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königl. Preuss. Akademie der Wissenschaften zu Berlin aus dem Jahre 1849. February. pp. 76–87. Berlin, 1850.

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C. gemmata.
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C. oblonga.
C. prætexta.
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V—THE WRITINGS OF JAMES HALL.

1.

HALL, JAMES. Organic remains. Descriptions of organic remains collected by Captain J. C. Frémont, in the geographical survey of Oregon and North California. <Rep. Expl. Exp. to the Rocky Mountains and to Oregon and North California, by J. C. Frémont. Appendix B, pp. 304–310, pls. i–iv. Washington, 1845.

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2.

HALL, JAMES. Description of new or rare species of fossils, from the Palæozoic series. <Rep. on the Geology of the Lake Superior Land district, by J. W. Foster and J. D. Whitney. Part ii, chapter xiii, pp. 203-231, pls. xxiii*a*–xxxv. Washington, 1851.

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3.

Hall, James. Letter from Professor James Hall, of New York, containing observations on the Geology and Palæontology of the country traversed by the expedition, and notes upon some of the Fossils collected on the route. <Exploration and Survey of the Valley of the Great Salt Lake of Utah, including a reconnaissance of a new route through the Rocky Mountains, by Howard Stansbury. Appendix E, pp. 398–414, pls. i–iv. Philadelphia, 1852.

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4.

HALL, JAMES. Descriptions and Notices of the Fossils collected upon the route. <Rep. Expls. and Survs. from the Mississippi River to the Pacific Ocean, vol. iii. No. 1, general report upon the geological collections, chapter ix, pp. 99–105, pls. i and ii. Washington, 1856.

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5.

HALL, JAMES. Geology and Palæontolgy of the Boundary. <U. S. and Mex. Boundary Survey. Report of William H. Emory, vol. i, part ii, pp. 101–140, and 144–146, pls. i and xx and xxi pars. Washington, 1857.

The fossils figured on pl. xx were apparently named by James Hall, but no descriptions accompany them.

Columnaria thomii, n. s., Hall, 1857, pl. xx, figs, 1 *a–d*.
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HALL, JAMES, *and* WHITFIELD, R. P. Palæontology. <Rep. Geol. Expl. 40th parallel by Clarence King, vol. iv, part ii, pp. 198–302, pls. i–vii. Washington, 1877.

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Hall, James, and **Meek, F. B.** (see **Meek, F. B.**, and **Hall, James**).

VI.—THE WRITINGS OF ANGELO HEILPRIN.

1.

Heilprin, Angelo. On some new species of Eocene mollusca from the southern United States. <Proc. U. S. National Museum, vol. iii, pp. 149–152, pl. 1, 1880. Washington, 1881.

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2.

Heilprin, Angelo. North American tertiary Ostreidæ. <4th Annual Rep. of the director of the U. S. Geological Survey. A review of the fossil ostreidæ of North America; and a comparison of the fossil with the living forms by C. A. White. Appendix I, pp. 309–316, pls. lxiv–lxxii. Washington, 1883.

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VII.—THE WRITINGS OF ALPHEUS HYATT.

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HYATT, ALPHEUS. [Descriptions of new genera and remarks on new species of Triassic fossils.] < Rep. Geol. Expl. 40th Parallel, by Clarence King. Vol. iv, part i, pp. 107–128 *pars*. Washington, 1877.

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2.

HYATT, ALPHEUS. [Description of the new genus Meekoceras, and remarks on the different species of the same.] < Contributions to Invertebrate Paleontology No. 5, Triassic fossils of Southeastern Idaho, by C. A. White. Twelfth Ann. Rep. of the U. S. Geol. and Geogr. Surv. of the Terr., by F. V. Hayden. pp. 112–116, pls. xxxi–xxxii. Washington, 1883.

An author's edition of these contributions was published in 1880.

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3.

HYATT, ALPHEUS. [Description of the new genus Enclimatoceras.] < On the Nautiloid genus Enclimatoceras Hyatt, and a description of the type species. < On Mesozoic fossils, by C. A. White, Bull. U. S. Geol. Surv. No. 4. Vol. i, pp. 16–17 of No. 4, or pp. 104–105 of vol. i. Washington, 1884.

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* *κόρυς*, a helmet; *κέρας*, a horn.

† *γυμνός*, naked; *νῶτος*, back; *κέρας*, a horn.

‡ *ακροχορδών*, a wart; *κέρας*, a horn.

§ *εὐ* (augm. part.); *τομος*, sharp; *κέρας*, a horn.

‖ *εὐ* (augm. part.); *δίσκος*, a quoit; *κέρας*, a horn.

VIII.—THE WRITINGS OF JULES MARCOU.

1.

Marcou, Jules. Sur la géologie des Montagnes Rocheuses, entre le Fort Smith (Arkansas) et Albuquerque (Nouveau Mexique). <Bull. Geol. Soc. France, 2d ser., vol. xi, pp. 156–160. Paris, 1854.

Mentions the existence, at Tucumcari, of the Jurassic formation, with *Gryphæa dilatata* and *Ostrea Marshii*.

2.

Marcou, Jules. Résumé of a geological reconnaissance extending from Napoleon, at the junction of the Arkansas with the Mississippi, to the Pueblo de los Angeles, in California. <U. S. Pacific R. R. Expl., 1853–'54, vol. iii, 8vo. Report of explorations for a railway route near the 35th parallel of latitude, from the Mississippi River to the Pacific Ocean, by Lieut. A. W. Whipple, Corps of Topographical Engineers, chap. vi, pp. 40–48. H. Doc. 129. [Washington, 1855.]

Mentions the occurrence of a number of fossils and employs for the first time the name *Gryphæa tucumcarii*.

3.

Marcou, Jules. Résumé d'une section géologique des Montagnes Rocheuses à San Pedro, sur la côte de l'Océan Pacifique. <Bull. Geol. Soc. France, 2d ser., vol. xi, pp. 474–478. Paris, 1855.

Mentions the occurrence of a *Gryphæa* at Laguna (New Mexico), and of Carboniferous fossils near the San Francisco Mountains (Arizona).

4.

Marcou, Jules. Geological notes of a survey of the country comprised between Preston, Red River, and El Paso, Rio Grande del Norte. <U. S. Pacific R. R. Expl., vol. iv, 8vo. Report of explorations of a route for the Pacific Railroad, near the 32d parallel of latitude from the Red River to the Rio Grande, by Brevet Capt. John Pope, Corps of Topographical Engineers. Chap. xiii, pp. 125–128. H. Doc. 126. [Washington, 1855.]

Mentions the occurrence of a number of fossils.

5.

Marcou, Jules. Résumé explicatif d'une carte géologique des États-Unis et des provinces anglaises de l'Amérique du Nord, avec un profil géologique allant de la vallée du Mississippi aux côtes du Pacifique, et une planche de fossiles. <Bull. Geol. Soc. France, 2d ser., vol. xii, pp. 813–936, pls. xx–xxi. Paris, 1855.

The occurrence of many fossils is mentioned in this paper.

Gryphæa dilatata, Sowerby, pl. xxi, figs. 1 *a*, *b*, and 2.
G. dilatata var. *tucumcarii*, Marcou, 1855, pl. xxi, fig. 3.
Ostrea marshii, Sowerby, pl. xxi, fig. 4.
Gryphæa pitcheri, Morton, pl. xxi, figs. 5 *a*, *b*, and 6.

6.

MARCOU, JULES. Notes géologiques sur le pays compris entre Preston, sur la rivière Rouge, et el Paso, sur le rio Grande del Norte. <Bull. Geol. Soc. France, 2d series, vol. xii, pp. 808–813. Paris, 1855.

In this paper the author mentions the occurrence of many fossils. The notes are made up from collections and observations brought back by Captain Pope, U. S. Top. Engrs., from his survey from the Red River to the Rio Grande, in 1854.

7.

MARCOU, JULES. Résumé and field-notes by Jules Marcou, geologist and mining engineer of the Expedition, with a translation by William P. Blake. <Rep. Expls. and Survs. from the Mississippi River to the Pacific Ocean, vol. iii, part. iv, pp. 121–164. Washington, 1856.

The occurrence of many fossils is mentioned in these field-notes, originally written in French.

8.

MARCOU, JULES. Résumé of a Geological reconnaissance extending from Napoleon, at the junction of the Arkansas with the Mississippi, to the Pueblo de los Angeles, in California. <Rep. Expls. and Survs. from the Mississippi River to the Pacific Ocean, vol. iii. Rep. of Lieut. A. W. Whipple, part iv, pp. 165–171. Washington, 1856.

This résumé is reprinted from the preliminary or first report of Lieutenant Whipple, in 8vo, chap. vi, p. 40, Reports of Pacific Railroad Surveys, House Doc. 129, Washington, 1855. A few notes are added.

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MARCOU, JULES. Geology of North America, with two reports on the Prairies of Arkansas and Texas, the Rocky mountains of New Mexico, and the Sierra Nevada of California, originally made for the United States Government, pp. 1–144, pls. i–ix. Zurich, 1858.

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Newberry, J. S. Descriptions of the Carboniferous and Triassic Fossils collected on the San Juan Exploring Expedition under Capt. J. N. Macomb, U. S. Engineers. <Rep. Expl. Exp. from Santa Fé, New Mexico, to the junction of the Grand and Green rivers of the Great Colorado of the West in 1859, under the command of Capt. J. N. Macomb, 135–148, pls. iii–viii. Washington, 1876.

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X.—THE WRITINGS OF DAVID DALE OWEN.

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OWEN, D. D. Description of some organic remains figured in this work, supposed to be new. <Rep. Geol. Expl. of part of Iowa, Wisconsin, and Illinois, by David Dale Owen. Appendix, pp. 69–86, pls. xi–xviii and p. 33, pl. vii. Washington, 1844.

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2.

OWEN, D. D. On the Geology of the Western States of North America. <Quart. Journ. Geol. Soc., London. Vol. ii, pp. 433–447, pl. xix. London, 1846.

This article, of which an abstract was given in the Proc. Geol. Soc., London., vol. iv, p. 1, contains many paleontological notes.

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OWEN, D. D. [Lists of fossils found.] <Rep. of a Geol. Recon. of the Chippewa land district of Wisconsin. 30th Congress, 1st session, Senate, Executive Doc. No. 57. Appendix, pp. 131–133. Washington, 1848.

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4.

OWEN, D. D., *and* SHUMARD, B. F. Descriptions of fifteen new species of Crinoidea from the subcarboniferous limestone of Iowa, collected during the U. S. Geological Survey of Iowa, Wisconsin, and Minnesota, in the years 1848-'49. <Journ. Acad. Nat. Sci., Philadelphia. Second series, vol. ii, part i, pp. 57-70, pl., vii. Philadelphia, 1850.

This article was afterward republished in Owen's U. S. Geol. Rep. of Iowa, Wisconsin, and Minnesota.

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OWEN, D. D., *and* SHUMARD, B. F. On the Number and Distribution of Fossil Species in the Palæozoic Rocks of Iowa, Wisconsin, and Minnesota. <Proc. Amer. Ass. Adv. Sci., fifth meeting, 1851. pp. 235–239. Washington and Cincinnati, 1851.

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OWEN, D. D., *and* SHUMARD, B. F. Description of seven new species of Crinoidea from the subcarboniferous limestone of Iowa and Illinois. < Journ. Acad. Nat. Sci., Philadelphia. Second series, vol. ii, part ii, pp. 89–94, pl. xi. Philadelphia, 1852.

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XIII.—THE WRITINGS OF ROBERT P. WHITFIELD.

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6.

WHITFIELD, R. P., *and* HALL, JAMES. (See Hall, James, and Whitfield, R. P.)

WHITFIELD, R. P., *and* WHITE, C. A. (See White, C. A., and Whitfield, R. P.)

SUPPLEMENT.

THE WRITINGS OF J. W. BAILEY.

Bailey, J. W. Notes concerning the minerals and fossils collected by Lieutenant J. W. Abert, while engaged in the geographical examination of New Mexico. <Rep. of Lieut. J. W. Abert of his Examination of New Mexico in the years 1846–'47. Ex. Doc. No. 41, pp. 547–548, and 3 plates. Washington [1849].

Plate [I] faces p. 522, and contains fossil leaves from the coal beds of the Raton.

Plate [II] faces p. 546, and contains sharks' teeth and some *Gasteropoda* from Poblazon and an [*Athyris*] from Tuerto.

Plate [III] faces p. 547, and contains an *Inoceramus* [*problematicus*] and a fossil leaf from the coal bed at Raton.

THE WRITINGS OF I. N. NICOLLET.

Nicollet, I. N. List of Fossils belonging to the several formations alluded to in the Report; arranged according to localities. <Rep. intended to illustrate a Map of the Hydrographical basin of the Upper Mississippi river made by I. N. Nicollet. 26th Congress, 2d session, Senate Ex. Doc. No. 237. Appendix C, pp. 167–170. Washington, 1843.

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A large number of fossils are mentioned by their generic names and said to be new species, but no specific name is given and they are not described.

THE WRITINGS OF HIRAM A. PROUT.

1.

Prout, H. A. Description of New Species of Bryozoa from Texas and New Mexico, collected by Dr. George G. Shumard, Geologist of the U. S. Expedition for Boring Artesian Wells along the 32d Parallel, under the direction of Capt. John Pope, U. S. Corps Top. Eng. <Trans. St. Louis Acad. Sci., vol. i, pp. 228–235. 1858. St. Louis, 1856–'60.

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Prout, H. A. Second Series of Descriptions of Bryozoa from the Palæozoic Rocks of the Western States and Territories. <Trans. St. Louis Acad. Sci., vol. i, pp. 266–273, pl. xvi, figs. 2 *a*, *b*. 1858. St. Louis, 1856–'60.

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THE WRITINGS OF BENJAMIN F. SHUMARD.

Shumard, B. F. Paleontology. <Rep. of a geological exploration from Fort Leavenworth to Bryan's Pass, made in connection with the survey of a road from Fort Riley to Bridger's Pass, under command of Lieutenant F. T. Bryan, topographical engineer, 1856, by H. Engelmann, geologist and mining engineer. <Rep. of the Secretary of War. Message from the President of the U. S. to the 35th Congress, 1st session, Ex. Doc. No. 2, vol. ii, pp. 517–520. Washington, 1857.

Gives two lists and notes of fossils, and describes one new species *Mytilus engelmanni*.

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Department of the Interior:

U. S. NATIONAL MUSEUM.

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 31.

SYNOPSIS OF THE NORTH AMERICAN SYRPHIDÆ.

BY

SAMUEL W. WILLISTON, M. D., PH. D.

◆

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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ADVERTISEMENT.

This work (Bulletin No. 31) is the forty-first of a series of papers intended to illustrate the collections of natural history and ethnology belonging to the United States, and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

It has been prepared at the request of the Institution, and printed by authority of the honorable Secretary of the Interior.

The publications of the National Museum consist of two series—the Bulletins, of which this is No. 31, in continuous series, and the Proceedings, of which the ninth volume is now in press.

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From time to time the publications of the Museum which have been issued separately are combined together and issued as volumes of the Miscellaneous Collections. These are struck off from the stereotype plates from which the first edition was printed, and in this form are distributed by the Smithsonian Institution to libraries and scientific societies throughout the world. Volume 13 of these collections includes Bulletins 1 to 10, inclusive; volume 19, volumes 1 and 2 of the Proceedings; volume 22, volumes 3 and 4 of the Proceedings; and volume 23, Bulletins 11 to 15, inclusive.

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SPENCER F. BAIRD,
Secretary of the Smithsonian Institution.

SMITHSONIAN INSTITUTION,
Washington, July 23, 1886.

DEPARTMENT OF THE INTERIOR:
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PREFACE.

That which has been aimed at in the present Synopsis is the description, as full and complete as possible, of the North American Syrphidæ. The labor involved in the determination of our diptera, save such as have been described or monographed by Dr. Loew and Baron Osten Sacken, is very great, owing to the often incomplete and unsatisfactory descriptions scattered through the literature of a half dozen languages. To bring together descriptions in such a way as will render the identification of our numerous species less toilsome and more certain, is the only means that will now materially further the study of American diptera; the description of desultory new species is detrimental to real progress in the knowledge of our fauna. My aim has been the study of genera and species, to so describe and figure those of the United States as to render them more easily determinable. With every page I write I feel more fully how difficult descriptive dipterology really is, and that only a beginning has been made in the study of this interesting family. But the work will, I trust, serve a useful purpose in pointing out what the needs and necessities are, and to pave the way for a future exhaustive monograph of the family, based upon a wider knowledge than is now possible.

I have given especial attention to this family since the beginning of my dipterological studies eight years ago, and have collected a large part of the species, either in New England or the West. I could not, however, have accomplished what I have, except by the aid of the many friends who have kindly sent me material. Without in any way depreciating the favors of others, I would express my acknowledgments especially to Prof. J. H. Comstock, of Cornell University, for the aid furnished me in the examination of a considerable collection, among which I found the very interesting genus *Senogaster;* to Mr. Eugene L. Keen, of Philadelphia, who, in the most generous way, gave me freely everything I desired from his industrious collecting; to Prof. C. V. Riley, of Washington, for the privilege of examining his large collections, including the excellent one of Mr. E. Burgess; and to Mr. D. W. Coquillett, of Anaheim, Cal., Mr. Theodore Pergande, of Washington, D. C., and Dr. George Dimmock, of Cambridge, for the addition of not a few species otherwise unknown to me. Other aid has been afforded me by

Prof. J. A. Lintner, of Albany, Mr. G. F. Gaumer, of New Mexico, and various others whose names will be found in their appropriate places. To all these I would express my sincerest thanks. Nor should I neglect to mention the extensive collections from the West and Southwest obtained from Messrs. H. K. Morrison and O. T. Baron, and from San Domingo, from Mr. G. F. Frazar.

Other kind favors, which I would gratefully acknowledge, were received from Prof. H. A. Hagen, of Cambridge, who kindly permitted me to study for several days in his laboratory the type collections of Loew and Osten Sacken. My readers will pardon me in the pride I take in stating that of nearly two hundred species which I had identified absolutely independently from descriptions, I found upon comparisons with the types and identified species in the Loew and Osten Sacken collection but three or four discrepancies. I can give no higher praise to the work of these two authors that admits of such close results. To Mr. S. H. Scudder, my thanks are due for his kindness and courtesy in permitting me to study his collections of fossil diptera and drawings. To Prof. A. Van Name, the librarian of Yale College, my sincere thanks are also due for his unfailing courtesy and assistance. Nor should I neglect to speak of the encouragement and assistance that have been afforded me by my wife.

Of the published writings on this family, I have been mostly indebted to those of Schiner, to whom the classification of the family owes much, and to the writings of Loew, Osten Sacken, Wiedemann, and others, wherever they were accessible. Of Baron Osten Sacken's work here, as elsewhere, I cannot speak in terms of too great praise. His descriptions are clear, accurate, and conscientious; I have never been in doubt regarding the correct identification of his species in this family. How much the present results are owing to his labors will be apparent to any one who will even cursorily examine the following pages. My heartiest thanks are likewise due him for the constant interest he has taken in my studies, during the years that I have had the pleasure of correspondence with him. Of Loew's work I need not speak. No better monument to a talented, learned, and versatile man exists anywhere in the domain of dipterological literature—and this field has been cultivated by most able, as well as poor workers—than in his Diptera Centuriæ and Monographs. His Latin descriptions are models, and very much of the synonymy of the American Syrphidæ is due to him. Nor should I fail to mention the conscientious work of Mr. F. M. v. d. Wulp, of Holland. He has not written a great deal on North American diptera, and that, unfortunately, is mostly in the Dutch language; but what he has written makes one wish that he had published more on our fauna in the English language, which he uses with fluency. Mr. J. F. M. Bigot, of Paris, has, with commendable zeal and industry, written much on the North American Syrphidæ; his works may be consulted with profit.

My work must have shortcomings and errors; the subject is by no means an easy one. I only ask that it be accepted as an honest endeavor to advance the study of these neglected but interesting insects.

The types of all but two or three of the new species described by me, together with my entire collection in this family, will be preserved in the National Museum for future reference and revision.

S. W. WILLISTON.

YALE COLLEGE, NEW HAVEN, CONN.,
June 1, 1886.

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PART I.

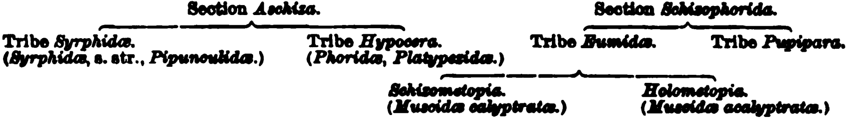
CLASSIFICATION.

NORTH AMERICAN SYRPHIDÆ.

PART I.—CLASSIFICATION.

The family of *Syrphidæ* is one of the most extensive in the order of diptera. Nearly or quite two thousand species are known from throughout the world, and many new forms are constantly being added. They contain among them many of the brightest-colored flies, and numerous specimens are sure to appear in every general collection of insects. None are injurious in their habits to man's economy, and many of them are very beneficial. In the following pages about three hundred species are described from the region north of Mexico, so that I trust even the non-entomological student, with a little exertion, may be able to identify them. That there are many more species within these limits is certain, especially in the southern and western regions. From Europe over five hundred and fifty species have been catalogued; doubtless nearly or quite as many will be eventually accredited to North America.

The family is easily and exactly defined; with but few exceptions by the presence of the spurious vein of the wings alone; in all, by the structure of the head and the neuration. Its position in the dipterological system is thus given by Brauer:



While, as a general rule, the *Syrphidæ* present excellent specific characters, there is a remarkable dearth of generic or group characters. The richness in species, the many intermediate forms, the absence of marked plastic variations, all tend to make the family in its subdivisions an exceedingly difficult one to define with clearness. From this fusion or coalescence of genera, we are often compelled to base our classification upon what appear very trivial differences. Species must be grouped together that show natural relationships, drawing the dividing lines where the largest intervals occur. Their classification ultimately must in many cases depend largely upon convenience, and the views of those best qualified to interpret natural characters. Not seldom these views will rest, more or less, upon an indefinable *tout ensemble*, the instinctive or natural grouping of the trained eye and mind. There are no generic and specific limitations in nature; this fact, thanks to modern philosophy, we have nearly all learned. But by no means does it follow that there is no such thing as classification. A horse and an ass might show all possible intermediate characters, so that one could not say when the horse put off the caballine and took on the asinine nature; but nevertheless the horse is still a horse and the ass an ass; the only vexatious question would be when and where to label the one *caballus* and the other *asinus*. So, indeed, does the question come home pertinently in the small fragment of zoological life treated in the following pages. With a knowledge of but few species, classification was not difficult, and definition easy, but with the discovery of numerous and multifarious forms generic bands become stretched and thinned till at last they are rent asunder, and nothing is left but individual coherence. Even a novice would be astonished at the proposition to unite a *Chrysogaster nitida* and a *Syrphus lapponicus* in the same genus, yet the chain between them is complete: nowhere do differences exist that can be accredited with more than specific valuation. Nor is this a solitary ininstance; the majority of genera in the family do not admit of true generic definition; the best that we can do is to point out where one shall end and the other begin, a proceeding which sometimes (*Helophilus*, for instance) entails the result that a species differs more from some of its own associates than it does from members of other genera. What, then, are we to do? Make a genus for every difference? As well abandon species. Make only genera that can be limited by generic characters? As well abandon the family. In steering clear of Scylla we may be engulfed in Charybdis.

No characters offer for the accurate or even clear separation into subfamilies. The best general division that we have was that proposed by the erudite Schiner, based upon the position of the anterior cross-vein. Though, like most of the higher characters in this family, it admits of no sharp definition, nor dispels doubt in many cases, it is unquestionably a natural one. In no case can a species with a well marked, oblique, and exterior cross-vein be placed among those with an internal and rectangular one, yet in not a few we cannot easily decide to which of the divisions a given species belongs. In the following classification I have recognized fourteen groups, not because they are clearly defined, for but very few are, but because some grouping is absolutely necessary. It has been criticised as in some respects artificial; this I by no means deny, in the sense that they cannot be separated, except upon ultimately trivial distinctions, but that they are in the main a natural grouping I do most earnestly contend. A faunistic classification is confessedly imperfect, though, as in the case of Osten Sacken's Tipulidæ, a limited classification may happily admit of a far wider application. In such a family as the Syrphidæ many disturbing elements must naturally intrude themselves with the ingress of new forms; but the knowledge of the world's fauna can only be obtained from the assimilation of more or less heterogeneous parts into one homogeneous whole. My autoptic knowledge of genera is almost exclusively confined to the European and North American forms, types of nearly all of which I have examined.

SYNOPTIC TABLE OF TRIBES.

a. Anterior cross-vein of the wings distinctly before the middle of the discal cell, usually nearly rectangular; third longitudinal vein rarely with a distinct curvature into the first posterior cell; hind femora rarely thickened. Usually smaller, more delicate species, generally thinly pilose .... SYRPHINÆ.
b. Third joint of the antennæ with a thickened styliform arista or style. Pelecocerini.
bb. Antennæ with a dorsal bristle.
c. Third joint of the antennæ not both elongate and with a strongly plumose arista; marginal cell open.
d. Antennæ longer than the head, rather large species .... Microdonini.
dd. Antennæ not longer than the head.
e. Front long, much narrowed above in the female, cheeks narrow, face considerably narrowed below, abdomen frequently contracted beyond the base, more or less slender .... Bacchini.
ee. Face not remarkably narrowed below.
f. Epistoma projecting, face without tubercle; abdomen contracted toward the base, in outline more or less club-shaped; small species. Spheginini.
ff. Not such species.
g. Color chiefly reddish or lutescent .... Brachyopini.
gg. Color not chiefly reddish or lutescent.
h. Metallic green, metallic green and black, or black species, rarely with luteous markings at base of abdomen, and on the humeri and face; abdomen never with entire shining cross-bands .... Chilosini.
hh. Black or greenish black species with yellow or yellowish stripes and bands, or at least with entire shining cross-bands on abdomen.
i. Face black .... Melanostomini.
ii. Face partly or wholly yellow .... Syrphini.
cc. Third joint of antennæ elongate, with a strongly plumose arista; marginal cell usually closed; thick-set species .... Volucellini.
aa. Anterior cross-vein near or beyond the middle of the discal cell, usually oblique; hind femora frequently thickened. Usually larger, robust, pilose species.
j. Antennæ with a dorsal bristle .... ERISTALINÆ.
k. Third longitudinal vein bent deeply into the first posterior cell ..... Eristalini.
kk. Third longitudinal vein only gently curved or straight.
l. Arista plumose.
m. Third joint of antennæ elongated .... Volucellini.
mm. Third joint of antennæ subquadrate; marginal cell open .... Sericomyini.
ll. Arista bare or pubescent.
n. Thorax with distinct yellow markings .... Milesini.
nn. Thorax without yellow markings .... Xylotini.
jj. Antennæ with a terminal style .... CERINÆ.

MICRODONINI.

Anterior cross-vein near the base of the discal cell, or near the middle, and more or less oblique. Marginal cell open. Legs slender, third joint of the antennæ, at least, elongate, the first more or less so. Large, species.

a. Face rounded, pilose.

b. First posterior cell with a stump of a vein from the third longitudinal vein; scutellum flattened, usually with two points ....MICRODON.

bb. First posterior vein without such a stump of a vein; scutellum without points. MIXOGASTER.

aa. Face produced downwards, bare ....CHRYSOTOXUM.

This group as here distinguished is artificial. *Microdon* is one of the most peculiar genera in the family. The presence of a stump of a vein in the first posterior cell is characteristic, reappearing in *Ceria*, and occasionally in species allied to *Eristalis*. The presence of points on the scutellum reminds one of the *Stratiomyidæ*, but the resemblance is not great. This character was used by Wiedemann to found the genus *Ceratophya*, but it is of slight importance, two such closely allied species as *M. globosus* and *M. fuscipennis* differing in its presence. *Mixogaster* doubtless finds a place here, notwithstanding its club-shaped abdomen, by reason of the structure of the head and wings. The European *Psarus* likewise evidently finds its nearest relationship here, though showing an affinity with *Paragus* of the next group.

Chrysotoxum is more aberrant, and is a disturbing element in the arrangement of the genera. The only thing it has in common with *Microdon* is the elongate antennæ; the neuration approaches more that of the second division. Singularly, too, the genus is a close one, the species all showing great structural and color resemblance. Why the group *Chrysotoxinæ* should be retained to embrace forms so diverse as *Orthoneura* and *Pipiza* I do not understand.

CHILOSINI.

Small to moderately large species, seldom with light markings (Paragus Chilosia, Pipiza *spp.*), *usually the color is uniformly dark, with or without metallic greenish markings, or wholly deep black, the face never yellow (except in* Paragus), *the abdomen never with entire cross-bands. Third longitudinal vein nearly straight, anterior cross-vein basal discal.*

a. Epistoma protuberant, antennæ often elongate, outer cross-veins more or less inflected.

b. All the femora thickened and with a row of short spines below; body clothed with sparse tomentum ....LEPROMYIA Will.

bb. Femora not thickened; body not tomentose.

c. Front in female, and face in both sexes often, with transverse wrinkles; false vein of wing usually obsolete..................CHRYSOGASTER Meig.

cc. Front and face not with wrinkles; face hairy, concave ....PSILOTA Meig.

aa. Epistoma not projecting, or, if so, the hind femora thickened; outer cross-veins more usually reflected, antennæ usually short.

d. Face evenly rounded and pilose..PIPIZA Fallen.

dd. Face not evenly rounded and pilose, tuberculate.

e. Abdomen with only four visible segments; arista short, subapical. NAUSIGASTER Will.

ee. Abdomen with at least five visible segments.

f. Face partly or wholly yellow; abdomen punctulate, antennæ elongate; small species..PARAGUS Latr

ff. Face wholly black, or at least only with luteous spots; antennæ short.

g. Hind femora slender..CHILOSIA Meig.

gg. Hind femora thickened; epistoma projecting.

h. Scutellum unusually large, nearly square in outline; males dichoptic. CHALCOMYIA Will.

hh. Scutellum not unusually large, considerably broader at the base; males holoptic..MYIOLEPTA Newm.

There is considerable diversity in this group, but there can be no natural division, so closely do the characters blend from one to the other, and because the relationships do not permit a linear arrangement of the genera. *Chilosia* may be taken as its most predominant type, from which *Chalcomyia* and *Nausigaster* depart the most. The genus itself is a large one, with a considerable diversity of forms, but which, so far, has eluded attempts at rational subdivision. The presence of a swollen frontal triangle, or frontal groove, is characteristic in not a few species, but they are evanescent, and not of sufficient uniformity to warrant their use exclusively as a generic distinction. The neuration varies from a Pipizoid to a Syrphoid type; none except artificial distinctions can be made use of here. The antennæ show only slight variations; generic characters based chiefly upon these organs are not generally reliable through out the family. The plumosity of the arista has been proposed as a means of distinction; but the plumosity is never very strong, and the ultimate generic boundary would often depend upon the power of the lens employed; nor can this character be used in connection with the pilosity of the eyes and the hairiness of the face, unless we are prepared to dub every possible permutation of the three characters with an independent title. The pilosity of the eyes is also unsatisfactory; its use will separate allied forms and bring together irrelevant ones; moreover, here, likewise, the microscope and possibly the imagination would sometimes be the ultimate generic distinctions. The hairiness of the face is in itself wholly insufficient, and bears no constant relation to the other more important characters. The thoracic bristles imperceptibly change to hair and then to pile. The limits of the genus are also doubtful. From *Chrysogaster* on the one hand, and *Melanostoma* on the other, nothing more than specific separation is yet possible. The relation to *Pipiza*, through *Chrysogaster* and *Psilota*, is equally obvious. Yet again we cannot overlook the natural affinity with species of *Myiolepta*.

Pipiza and *Psilota*, as here employed, are unquestionably nearly related forms; indeed further discoveries may require their union. The former genus has been very much subdivided. A knowledge of numerous species, however, constantly tends to break down the distinctions. The following are the characters used by Kowarz,[*] an able European dipterologist, to define the generic subdivisions:

1.—Third antennal joint slender and long 2
Third joint short and broad 3
2.—The auxiliary vein terminates before the anterior cross-vein.....PIPIZELLA Rond.
The auxiliary vein terminates beyond the anterior cross-vein....HERINGIA Rond.
3.—Frontal triangle of the male comparatively large and arched; front of female without a tuft of white hairs near the orbit 4
Frontal triangle not large, of usual form; front of female with a tuft of white hairs near the orbit.................................... PIPIZA Fallen.
4.—Hind coxæ of male with spinous process; front of female with a distinct transverse groove near the middle ....CNEMODON Egger.
Male coxæ without spinous process; front of female without transverse groove.................................... PENIUM Phil.

An examination of these characters seriatim will, I think, show their invalidity as generic distinctions. I by no means wish to say that they are without value, or that the names should be abandoned, but that their present substitution is not justified.

1. All intermediate stages will occur between a long, slender antenna and a short broad one, where it will be impossible to refer a species to either of these divisions without we take an artificial standard.

2. The same may be said of the termination of the auxiliary vein. What will we do with the species where the termination is opposite the cross-vein?

3. The presence of a swollen frontal triangle is a useful character, but the same objection may be urged against it as against the two preceding ones. The same feature occurs in species of both *Chilosia* and *Chrysogaster*, and was formerly made use of, in the former at least. Its acceptance here will, *pari passu*, necessitate its employment in allied genera.

4. The presence of a coxal spine is perhaps of greater value, yet we must not forget that the same character is disregarded elsewhere in the family. No one will think of generically separating *Xylota bicolor* and *X. tibialis*, or *Helophilus distinctus*, that has been confounded with *H. chrysostomus*, on this character.

The introduction of such fine distinctions is undesirable in any genus when characters of the same or similar nature are unrecognized in allied genera. It is true that arbitrary distinctions in the comparative shape of the antennæ, etc., we are compelled to use to a great extent in the *Muscidæ calyptratæ*; but at the same time we must admit the almost insuperable difficulties which these families present to systematic study; so great, indeed, that there are but three or four entomologists (among whom we must award to Mr. Kowarz the first rank) who are capable of interpreting them.

Two species of *Triglyphus* have been described by Loew; both of them I have placed under *Pipiza*, as from an examination of the types

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[*] Wien Ent. Zeitung, iv, 241.

at Cambridge I could not discover differences. The genus, as I understand it, is based upon the presence of but four visible segments in the abdomen with elongation of the median ones. The types of these species, however, show the fifth segment to be as well developed as in other species of *Pipiza*, and with no appreciable greater development of the third and fourth segments.

The genus *Nausigaster* is a very peculiar one, and has only slight relationship to the other genera, except perhaps *Paragus*. On account of its general habitus, its punctate markings, and the structure of the abdomen, I place it here.

It may be objected that I place the genus *Myiolepta* in this group. Perhaps did I know the European species, I should feel the force of the objection myself, but certainly in the American species the affinity with species of *Chilosia* cannot be overlooked. Where the hind femora are but little thickened, and without spines, there is but little to distinguish them; even the luteous coloration in the female of some species mimics that in the females of some *Chilosiæ*, and the male facial tubercle repeats itself in certain *Chilosiæ* and *Chrysogastræ*.

How Loew could have overlooked the striking relationship between *Lepromyia calopus* and *Myiolepta strigilata* I cannot account for. In the latter the third joint of the antennæ is distinctly elongate, the femora are all thickened, with short spines below, and the body is clothed with sparse tomentum, all characters of the genus. The genus thus holds an intermediate position, connecting *Chrysogaster* and *Myiolepta*.

MELANOSTOMINI.

Small, elongate, thinly pilose species, deep black or shining green, the abdomen usually slender with interrupted bands of bright yellow, orange, or greenish-yellow color; face uniformly black, or at least never with light ground color. Antennæ short, face tuberculate; neuration Syrphoid; legs slender.

a. Wings not longer than the abdomen; ocellar tubercle large, prominent; abdomen depressed, the lighter markings ferruginous or orange colored. PYROPHÆNA Schiner.

aa. Wings longer than the abdomen; ocellar tubercle not unusually large; abdomen more slender, the cross-bands yellow or greenish yellow, sometimes shining metallic.

b. Front tibiæ and tarsi of the male dilated, those of the female slightly widened. PLATYCHIRUS St. Fargeau and Serville.

bb. Front tibiæ and tarsi in both sexes slender, not widened..MELANOSTOMA Schiner.

The genus *Melanostoma* may be taken as the type of this group. The only ultimate difference between this genus, so far as I can discover or define, and *Chilosia* is in the absence of entire abdominal cross-bands. On the other hand, the distinction from *Syrphus* is purely specific. The relationships of *Platychirus* and *Pyrophæna* are obvious; indeed in the female there is scarcely any appreciable difference, at least in the former genus. *Pyrophœna* is an excellent example of a faulty taxonomic classification; while the flattening of the forelegs is made a generic character in *Platychirus*, much greater structural differences in the legs of *Pyrophœnæ* only receive a specific valuation. Undoubtedly, should the number of species warrant it, a generic line will be drawn between *P. ocymi* and *P. rosarum*, but on the basis of natural classification it should not matter whether a genus contained one or one thousand species.

It may be objected that this group is not entitled to the rank I give it; but if it be united with the *Syrphini*, the *Chilosini* must be also. Shall we place *Chrysogaster* and *Syrphus* in one group? As well place the whole family in one group.

SYRPHINI.

Black or greenish-black species, usually with yellow abdominal bands, the face wholly or in part yellow. Marginal cell of the wings wide open, third vein rarely (Didea) *curved into the first posterior cell, anterior cross-vein near the base of the discal cell. Antennæ short, face tuberculate, abdomen usually oval, legs slender, hind femora rarely thickened* (Mesograpta *sp.*).

a. Thickly pilose species; abdomen quite oval, broader beyond the middle. Basal portion of abdomen yellow, terminal portion black .... LEUCOZONA Schiner.

aa. Rather bare species; abdomen not so marked.

b. Thorax never with yellow lateral markings.

c. Sixth abdominal segment of the male as long as the two preceding together, but narrower, somewhat tubular, unsymmetrical; on underside of the seventh segment with two long linear subparallel appendages, arcuate, bidenticulate at the end, embedded in grooves when at rest. In the female the fifth segment half as long as the preceding. Scutellum much raised, exposing metanotum.....EUPEODES O. S.

cc. Hypopygium without slender appendages, sixth segment of male not peculiar; fifth segment of female one-third or one-fourth as long as preceding segment.

d. Third longitudinal vein with a distinct curvature into the first posteror cell; third joint of the antennæ elongate-oval..............DIDEA Macq.

dd. Third longitudinal vein straight or gently curved; third joint of antennæ short oval.

e. Eyes of male with an area of enlarged facets above; front very convex; hypopygium very small ....CATABOMBA O. S.

ee. Eyes of male without an area of enlarged facets above; front moderately convex; hypopygium not very small.......................SYRPHUS Fabr.

bb. Thorax with yellow lateral stripes.

f. Eyes of male with an area of enlarged facets above; fourth segment of abdomen in both sexes with two median yellow stripes and an oblique spot on each side ....ALLOGRAPTA O. S.

ff. Eyes of male wholly without an area of enlarged facets above; fourth segment of abdomen not so marked.

g. Face receding; thorax without median dorsal cinereous line. XANTHOGRAMMA Schiner.
gg. Face strongly projecting below.
h. Dorsum of thorax with a median cinereous line..............MESOGRAPTA Loew.
hh. Dorsum of thorax without such line ....SPHÆROPHORIA St. F. & Serv.

The genus *Syrphus*, as now restricted, presents a remarkable uniformity in structural characters, and even in markings, as well as in the fixity of specific characters. A few divergent forms, it is true, as *S. geniculatus*, are seen, but on the whole the genus is a close one; this, however, has not prevented attempts at subdivision. There are, though, many osculating points among its correlated forms. From *Didea*, through *S. arcuatus lapponicus*, nothing more than specific differences are found. From *Xanthogramma*, through *X. emarginatum*, differences of even less value appear. Its coalescence with *Melanostoma* (through *S. simplex*, for instance) has already been touched upon. Other allied genera are *Catabomba* and *Eupeodes*, where the differences are almost wholly confined to the male sex. *Leucozona* is structurally allied, but the pilosity and markings remove it further. With *Allograpta*, *Sphœrophoria*, and *Mesograpta*, the relationship is likewise very apparent. All these have a more or less elongate abdomen, as in some species of *Syrphus*, but besides the yellow markings of the thorax the structure of the head is similar in the last two, to which *Asarkina* may be added.

PELECOCERINI.

The genus *Pelecocera* shows the nearest relation with the *Syrphini;* but the structure of the head removes it so far from the other genera that I prefer to give it an independent place here for the present.

SPHEGININI.

Small, slender, elongate, thinly pilose species, with more or less yellow markings on head and abdomen. Antennæ short, epistoma produced; marginal cell of the wings open, third longitudinal vein straight or gently curved, anterior cross-vein near the base of the discal cell and rectangular, abdomen contracted towards the base, the greatest width beyond the middle, in outline club-shaped or spatulate; hind femora thickened.

b. Epistoma produced anteriorly, in profile deeply concave from antennæ to tip; third joint of antennæ nearly orbicular. ....SPHEGINA Meig.
bb. Epistoma produced more downward, in profile slightly concave from antennæ to tip ....NEOASCIA Will.

This group in America offers well-defined limitations, characterized by the small size, abdomen, and face. It is one of the oldest geologically.

BRACHYOPINI.

Moderate sized, nearly bare species, chiefly or wholly reddish or luteous, or, if in large part black, without light yellow markings. Antennæ short; abdomen not club-shaped; anterior cross-vein before middle of the discal cell, marginal cell wide open.

a. Epistoma produced into a long slender porrected snout; femora slender; the third longitudinal vein joins the costa beyond the tip...RHINGIA Scopoli.

aa. Face not so produced, hind femora more or less thickened.

b. Face produced, obtusely tuberculate, thorax with bristles, abdomen elongate, EUGENIAMYIA Will.

bb. Face carinate, abdomen oval, first posterior cell short petiolate.

c. Arista bare ....BRACHYOPA Meig.

cc. Arista plumose ....EXOCHILA Rond.

These genera present a considerable divergence, but are best associated together. Why they should hitherto have been classed among the *Volucellinæ*, rather than the *Syrphinæ*, I do not understand. *Rhingia* is well marked in its remarkably projecting epistoma. In neuration it finds its greatest resemblance in some species of *Chilosia*.

Brachyopa, *Exochila*, and *Eugeniamyia* are all closely allied, and might, perhaps, be best associated in the same genus. There is a tendency in all the genera to the presence of thoracic bristles.

VOLUCELLINI.

Mostly large species, uniform in color or variable. Third joint of the antennæ more or less elongate, the arista always plumose; eyes usually pilose; body nearly bare or thickly pilose; abdomen short, thick, strongly convex above; marginal cell of the wings usually closed and petiolate, third longitudinal vein nearly straight, the fourth vein joins the third a considerable distance before the tip, inflected; anterior cross-vein usually towards the base of discal cell; legs slender, hind femora never thickened.

a. Arista very densely plumose, appearing like a solid mass...COPESTYLUM Macq.

aa. Arista feathery plumose ....VOLUCELLA Geof.

The present and following groups contain, with few exceptions, more robust, thick-set, and usually pilose, species. The two genera from the United States, located here, are sharply separated from all others by the presence of a closed marginal cell and plumose arista. In certain species of *Volucella*, however, the marginal cell is closed very near the tip of the second longitudinal vein, and rarely, in some individuals, is narrowly open. Such species form the natural connection with *Phalacromyia*, differing only in this respect, a genus, so far, extralimital, and bearing the same relation to *Volucella* that *Helophilus* does to *Eristalis*. It is very desirable that *Volucella* should be divided; the species are numerous, and a considerable variation exists among them. No characters have, however, in my opinion, been found that will accomplish this result satisfactorily. *Temnocera* St. Farg. & Serville, and *Atemnocera* Bigot, are too artificial in their limitations. The former is based upon the excision of the third joint of the antennæ and the presence of bristles upon the scutellum. In a number of species the bristles are present without the antennal character—for these *Atemnocera* is proposed. But to be consistent yet another division should be created for the excised antennæ without the scutellar bristles, as in *Volucella megacephala*. Even such a dismemberment of the genus might be well, were it natural, but it is not; allied species are torn asunder and unrelated ones are thrown together. A natural classification, moreover, would require the same treatment of *Phalacromyia*.

SERICOMYINI.

Large species; antennæ short, the third joint scarcely longer than broad; arista basal, plumose; anterior cross-vein of wings oblique, near the middle of discal cell; hind femora sometimes thickened.

a. Moderately pilose; abdomen with yellow interrupted cross-bands............. Sericomyia Meig.
aa. Thickly pilose, abdomen uniformly black................Arctophila Schiner.

This group at present is limited without much difficulty. Still the forms are not very closely allied in some of their species. The connection between the two genera is found in *S. militaris*. In *Arctophila flagrans* the thickened hind femora and curved third longitudinal vein present a relationship with the next group.

ERISTALINI.

Mostly large, pilose species, uniform in color, or more or less variegated; third joint of the antennæ short, oval or transverse; third longitudinal vein with a deep concavity into the first posterior cell; anterior cross-vein near or beyond the middle of the discal cell; hind femora thickened, except in species of Eristalis.

a. Marginal cell closed and petiolate.
b. Thorax never with yellow markings.
c. Frontal triangle of male strongly protuberant ....Doliosyrphus Bigot.
cc. Front evenly arched...Eristalis Latr.
bb. Thorax with yellow spots.
d. Hind femora without a conical projection below, near the end, Pteroptila Loew.
dd. Hind femora with a projection below (*Milesia*).
aa. Marginal cell open.
e. Arista plumose (*Sericomyini*).
ee. Arista bare.
f. Face with a longitudinal ridge in the middle; hind femora strongly thickened, and with an angular protuberance below.......Tropidia Meigen.
ff. Face not distinctly carinate; tuberculate or rounded.
g. Thorax and scutellum not densely pollinose above.
h. Third joint of antennæ oval; dorsum of thorax usually with distinct stripes, Helophilus Meigen.
hh. Third joint of antennæ broad; throax not vittate.
i. Thickly pilose...Mallota Meigen.
ii. Thinly pilose ....Triodonta Will.
Teuchocnemis O. S.
gg. Thorax and scutellum very densely pollinose above......Pterallastes Loew.

This group is a natural one, but it is not distinctly separated from the following. *Eristalis* shows a considerable diversity in coloration, but less in structure. In many of the species the hind femora are slender, in others sometimes much thickened (*Simoides* Lw.); this character will not, however, serve for generic separation. Nor can the absence of the moderate plumosity of the arista (*Eristalomyia* Rond.) serve to divide the genus. It throws together unrelated species. The pilosity of the eyes seems to be equally unsatisfactory. The relationship of *Plagiocera*, *Senaspis*, *Priomerus*, *Doliosyrphus*, *Megaspis*, etc., cannot always be sharply defined. Two of these appear in our fauna, and will readily be distinguished by the general habitus, structure of the head, etc. In North America, *Eristalis* is sharply distinguished from *Helophilus* by the closure of the marginal cell. In Europe and Africa, however, the two genera coalesce, some species of *Eristalis* having dichoptic males (*Eristalinus* Rond.); other species of *Helophilus* holoptic males and without any of the characteristic markings, and with the marginal cell only narrowly open. So, too, *Helophilus* is ultimately distinguished from *Mallota* only by a very slight difference in the third joint of the antennæ.* The group of genera immediately surrounding *Mallota* is an unsatisfactory one, and very difficult to define. *Pterallastes* will be easily distinguished by its general habitus, and the presence of dense pollen on the upper surface of the thorax and scutellum, but *Teuchocnemis* and *Triodonta* are not so easily disposed of; both of them differ from *Mallota* in being thinly pilose, but there is no other tangible character. *Teuchocnemis* was based upon the presence of an internal hind tibial spur in the male, but the same feature occurs in the true *Mallotæ*. The two species placed in this genus are not homogeneous. *Triodonta* cannot be placed under *Merodon*, on account of the antennæ, termination of the fourth vein, etc.; its dichoptic male is common to European species of *Mallota*. It is very singular that the genus *Merodon*, so richly represented in Europe, does not occur in our fauna. The relationship of *Mallota* is evident with *Xylota*. (See Schiner, Nov. Exped., 360.)

XYLOTINI.

Third longitudinal vein only gently curved, marginal cell open; anterior cross-vein near or beyond the middle of discal cell, usually oblique; antennæ short; thorax without yellow markings.

Xylotini.—Abdomen more or less elongate; hind femora more or less thickened, with projections or spines below; face without tubercle; nearly bare species; eyes large.

a. Face strongly carinate; hind femora thickened, with an angular protuberance below near the end .... TROPIDIA Meig.

aa. Face not carinate.

b. Third segment of the abdomen in the male very much contracted, cylindrical, the hind femora much thickened, with a bifid spine below at the tip. Eyes very large, face small .... SENOGASTER Macq.

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* Even this difference is not accepted by Schiner in *Helophilus antipodus* Sch.—Novara Exped., 359.—Auckland.

bb. Hind femora more or less thickened, with spines or bristles below, never with a bifid spine near the tip.

c. Hind femora very much thickened, anterior cross-vein rectangular, **Syritta** St. F. & Serv.

cc. Hind femora never remarkably thickened, hind coxæ often with spinous process; cross-vein always oblique .... **Xylota** Meig.

Criorhinini.—Mostly large species, pilose.

a. Scutellum, margin of thorax, and pleuræ with bristly hairs; face distinctly tuberculate; femora slender .... **Chrysochlamys** Rond.

aa. Thorax wholly without bristly hairs.

b. Face short, not produced, concave, not tuberculate; hind femora more or less thickened.

c. Abdomen elongate.

d. Abdomen shining or opaque black .... **Brachypalpus** Macq.

dd. Abdomen with bright bronze cross-bands .... **Calliprobola** Rond.

cc. Abdomen very broad, thorax densely pilose, large species, **Pocota** St. Farg. & Serv.

bb. Face produced, longer than the front.

e. Face produced forward, pointed, concave from the antennæ to the tip, not tuberculate, subcarinate; hind femora thickened .... **Crioprora** O. S.

ee. Face not evenly concave, tuberculate.

f. Third joint of antennæ produced above into a conical process, terminating in the thickened arista; femora slender .... **Merapioidus** Bigot.

ff. Third joint of antennæ transversely oval, but little broader than long; femora rarely thickened .... **Criorhina** Macq.

Tropidia, *Senogaster*, *Syritta*, and *Xylota* form a natural, slightly divergent group, showing an unquestionable relationship on the one hand with *Mallota*, on the other with *Brachypalpus*.

The relationship of *Brachypalpus* with *Pocota* and *Calliprobola* is evident, and between these and *Criorhina*, *Crioprora* forms a natural connection. *Merapioidus* and *Chrysochlamys* are less intimately related.

MILESINI.

Large species, thinly pilose or nearly bare, with yellow spots or stripes on the thorax above, the abdomen conspicuously yellow banded. Anterior cross-vein beyond the middle of the discal cell, oblique; third longitudinal vein gently curved (except in Milesia). *Antennal arista bare; hind femora elongated and moderately thickened.*

a. Hind femora with a conical protuberance below, near the end.

b. Marginal cell of wing closed; antennæ short .... **Milesia** Fabr.

bb. Marginal cell open, antennæ more or less elongate .... **Spilomyia** Meig.

aa. Hind femora without such protuberance; marginal cell open.

c. Antennæ inserted high up, on a conical projection; front short, face much produced downward .... **Sphecomyia** Latr.

cc. Antennæ situated low down, short; face not longer than the front.. **Temnostoma.**

Spilomyia and *Temnostoma* are closely allied, as is also *Sphecomyia*. *Milesia*, in the structure of the face and wings, is more remote, but the legs and general habitus show an incontestable relationship.

The nearest relationship in the preceding group is evidently with certain species of *Criorhina*. A resemblance between *Milesia* and *Pteroptila* cannot be overlooked.

CERINÆ.

Rather large, bare, elongate species; antennæ longer than the head, second and third joints swollen, terminating in a style; anterior cross-vein beyond the middle of the discal cell, nearly straight; third longitudinal vein with a stump projecting into the first posterior cell. . . . CERIA Fabr.

This genus has been divided on the presence or absence of the frontal process, but the character is insufficient.

CHARACTERS OF THE FAMILY SYRPHIDÆ.

*A false longitudinal vein between the third and fourth longitudinal veins;** *fourth longitudinal vein united at its extremity with the third; basal cells large; face without subantennal grooves.*

Head hemispherical, often elongated or produced in the lower part, as broad or a little broader than the thorax. Face moderately broad, bare, or clothed with dust or short pile, excavated in profile under the antennæ and projecting below, or with a distinct convexity near the middle part; never with longitudinal furrows or lateral ridges, usually convex transversely, sometimes with a median ridge. Oral opening large; proboscis rarely much elongated, usually but little projecting, and, when at rest, concealed within the mouth; palpi one-jointed; labrum-epipharynx, hypopharynx, maxillæ and labium present. Front never excavated, often swollen, sometimes with a more or less elongate process which bears the antennæ. Antennæ usually porrect, approximate at their base, three-jointed; the third joint more especially of varied shape, usually flattened and with a dorsal bristle, either bare or plumose; very rarely the third joint is not flattened, and is provided at the tip with a thickened style. Eyes large, bare or pilose, in the male usually contiguous between the base of the antennæ and ocelli. Ocelli always present. Thorax comparatively large and robust, moderately arched above; scutellum large, usually convex, often translucent, rarely with spines on its border. Tegulæ of moderate size. Abdomen composed of five or six visible segments, rarely with only four. Hypopygium usually not prominent. Shape of the abdomen variable; slender, linear, clubbed, short, oval, and all intermediate forms. Legs usually weak, sometimes strong; the hind femora not infrequently moderately or much thickened, the hind tibiæ not rarely arcuated and compressed, metatarsi rather long, coxæ short; the hind coxæ, femora, and tibiæ, more especially in the male, in not a few species, armed with spurs, protuberances, or spines; the front and middle tibiæ and tarsi rarely flattened, or with structural variation. Macrochætæ rarely present in any part of the body; the body generally thinly pilose or nearly bare, but sometimes clothed with thick pile. Wings comparatively large, when at rest folded together over the abdomen, or half open; third longitudinal vein never forked, frequently with a more or less deep curvature on the outer part; marginal cell opened or closed, the fourth vein terminates in the third vein at or before the tip; neither of the intercalary veins present; anal cell always closed before the border of the wing; anterior cross-vein before or beyond the middle of the discal cell; *between the third and fourth longitudinal veins and nearly parallel with them there is a false or spurious vein,* nearly always present, and characteristic of the family.

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* Sometimes absent in *Chrysogaster*, *Volucella*, etc.

TABLE FOR THE DETERMINATION OF GENERA.

1.—	Antennæ with a terminal style	**2**
	Antennæ with a dorsal bristle	**3**
2.—	Antennæ cylindrical, first two joints elongate	**Ceria,** 259
	First two joints short, third compressed (plate iv, fig. 14)	**Pelecocera,** 110
3.—	Marginal cell of the wing closed and petiolate	**38**
	Marginal cell open	**4**
4.—	Anterior cross-vein of the wing distinctly before the middle of the discal cell, usually rectangular	**5**
	Anterior cross-vein ending near or beyond the middle of the discal cell usually oblique	**43**
5.—	Antennæ elongate	**6**
	Antennæ short	**11**
6.—	Dorsum of thorax without yellow lateral stripes	**7**
	Dorsum of thorax with yellow lateral stripes; large species (plate i, fig. 5)	**Chrysotoxum,** 13
7.—	Face rounded, pilose, not tuberculate, oral margin not projecting	**8**
	Face not evenly arched; tuberculate, or the oral margin projecting	**9**
8.—	Large species; scutellum flattened, usually with spines or tubercles; a stump of vein in the first posterior cell from the third longitudinal vein (plate i, figs. 1–3)	**Microdon,** 3
	Small species; scutellum without points; no such projecting stump (plate ii, fig. 1)	**Pipiza,** 22
9.—	Body clothed with sparse tomentum; all the femora thickened and with a row of short spines below (see, also, *Myiolepta strigilata*)	**Lepromyia,** 31
	Body not tomentose; all the femora not thickened and not with spines below	**10**
10.—	Face tuberculate below, partly or wholly yellow; epistoma receding; face and front not wrinkled (plate i, figs. 7–9)	**Paragus,** 17
	Epistoma projecting; front and face with transverse wrinkles (plate ii, figs. 6–9)	**Chrysogaster,** 31
11.—	Face black in ground color	**12**
	Face more or less yellow in ground color	**20**
12.—	Abdomen with only four visible segments; first two joints of the antennæ very short, third large, subquadrate, with a short, subterminal arista (plate i. fig. 10)	**Nausigaster,** 21
	Abdomen with more than four visible segments	**13**
13.—	Hind femora distinctly thickened	**14**
	Hind femora but little or not at all thickened	**15**

14.—Scutellum unusually large, nearly square; males dichoptic (plate iv, fig. 14) **Chalcomyia**, 126

Scutellum not unusually large, considerably broader at the base; males holoptic and with a facial tubercle (plate v, figs. 1–2) . . . **Myiolepta**, 127

15.—Epistoma projecting; small black species **16**

Face tuberculate, the oral margin not projecting **17**

Face rounded, pilose, not tuberculate, the oral margin not projecting (plate ii, figs. 2–5) . . . . **Pipiza**, 22

16.—Front in female, and the face in both sexes usually, with transverse wrinkles (plate ii, fig. 10) . . . . **Chrysogaster**, 31

Face and front not wrinkled; face pilose, without tubercle . . **Psilota**, 30

17.—Metallic green, metallic green and black, or black species; abdomen oval, never with entire shining cross-bands (plate iii, figs. 1–5) . . . **Chilosia**, 38

Black with more or less metallic green or blue, with yellow or yellowish abdominal markings, or if not, at least with entire shining cross-bands; abdomen usually elongate **18**

18.—Wings not longer than the abdomen; ocellar tubercle large; abdomen depressed, long elliptical, somewhat narrowed toward the base, the lighter markings ferruginous or orange-yellow (plate iii, fig. 13) **Pyrophæna**, 54

Wings longer than the abdomen, usually more slender species, abdominal cross-bands yellow or greenish yellow, or sometimes shining metallic . . **19**

19.—Front tibiæ, distally, and tarsi of the male dilated, those of the female a little widened (plate iii, figs. 10–12) . . . . **Platychirus**, 56

Front tibiæ and tarsi slender in both sexes . . . . **Melanostoma**, 46

20.—Dorsum of thorax with yellow lateral stripes **29**

Dorsum of thorax not with yellow lateral stripes **21**

21.—Abdomen narrowed toward the base, in outline club-shaped or spatulate . **22**

Abdomen oval or slender, not spatulate or club-shaped **24**

22.—Hind femora slender; abdomen elongate, slender toward the base; front of female long, narrow above (plate iv, figs. 7–9) . . . . **Baccha**, 116

Hind femora thickened **23**

23.—Epistoma produced anteriorly, in profile deeply concave from antennæ to oral margin; third joint of antennæ rounded (plate iv, figs. 11, 12 **Sphegina**, 113

Epistoma produced more downward, in profile gently concave; third joint of antennæ not rounded (plate iv, fig. 10) . . . . . . **Neoascia**, 111

24.—Abdomen with definite yellow cross-bands, interrupted or entire **25**

Abdomen not with definite yellow cross-bands **32**

25.—Hind femora extraordinarily thickened . . . . **Syritta**, 239

Hind femora slender **26**

26.—Sixth abdominal segment in the male as long as the two preceding together, cylindrical (plate iii, fig. 14); fifth segment in the female one-half as long as the preceding . . . . **Eupeodes**, 64

Sixth segment not peculiar; the fifth segment in the female one-third or one-fourth as long as the preceding **27**

27.—Front very convex; eyes of male with an area of enlarged facets above (plate iv, fig. 1) . . . . **Catabomba**, 62

Front not remarkably convex **28**

28.—Third longitudinal vein with a distinct curvature into the first posterior cell; third joint of antennæ elongate oval (plate iv, fig. 4) . . . . **Didea**, 89

Third longitudidal vein straight or gently curved . . . . . **Syrphus**, 66

29.—Dorsum of thorax with a median cinereous line . . . . . **Mesograpta**, 98

Dorsum without such line **30**

30.—Eyes of male with an area of enlarged facets above; fourth segment of abdomen with two median yellow stripes and an oblique side spot **Allograpta**, 96

Eyes of male not with an area of enlarged facets above; fourth abdominal segment not so marked 31

31.—Face projecting below; slender species (plate iv, fig. 16) . **Sphærophoria**, 104

Face receding below; adomen oval, at least not slender **Xanthogramma**, 91

32.—Abdomen oval, black, basal portion light-colored; thickly pilose species (plate iii, fig. 6) . . . . **Leucozona**, 61

Thinly pilose species, not so marked 33

33.—Hind femora thickened 34

Hind femora slender 37

34.—Species wholly or chiefly reddish or lutescent 36

Black species, sometimes with luteous spots on face, humeri, basal angles of abdomen, etc 35

35.—Scutellum unusually large, nearly square in outline; males dichoptic **Chalcomyia**, 126

Scutellum not unusually large, considerably broader at the base; eyes of male holoptic . . . . **Myiolepta**, 127

36.—Face carinate; abdomen oval (plate v, figs. 5–7) . . . . . **Brachyopa**, 131

Face produced, obtusely tuberculate (plate v, fig. 4) . . **Eugeniamyia**, 130

37.—Epistoma produced into a long porrected snout (plate v, fig. 3) . **Rhingia**, 129

Epistoma not at all produced. (See, also, *Baccha*, 116.) . . . . **Chilosia**, 38

38.—Third longitudinal vein bent deeply into the first posterior cell 40

Third vein not deeply bent into the first posterior cell; antennæ elongate . 39

39.—Arista feathery plumose (plate vi) . . . . **Volucella**, 134

Arista very densely plumose, appearing like a solid mass . **Copestylum**, 151

40.—Hind femora with sharp tooth-like projection below near the outer end; large species (plate xii, fig, 2) . . . . **Milesia**, 254

Hind femora without tooth-like projection below 41

41.—Frontal triangle of male strongly protuberant (plate viii, fig. 8) **Doliosyrphus**, 178

Frontal triangle not protuberant 42

42.—Thorax with distinct yellow markings; femora thickened; hypopygium large (plate vii, fig. 1) . . . . **Pteroptila**, 179

Thorax without distinct yellow markings; hind femora occasionally thickened; hypopygium not prominent . . . . **Eristalis**, 158

43.—Arista plumose (plate vii, figs. 2–5) 44

Arista bare or pubescent 45

44.—Thinly pilose, abdomen with yellow bands . . . . **Sericomyia**, 153

Thickly pilose, abdomen without yellow . . . . **Arctophila**, 157

45.—Third longitudinal vein bent deeply into the first posterior cell; hind femora thickened 46

Third vein only gently curved 51

46.—Face with a sharp longitudinal ridge in the middle; hind femora with an angular protuberance below near outer end . . . . **Tropidia**, 206

Face tuberculate or arched, not carinate 47

47.—Thorax and scutellum very densely pollinose above (plate viii, fig. 9). **Pterallastes**, 198

Scutellum not densely pollinose above 48

48.—Third joint of antennæ broad, thorax not vittate 49

Third joint oval; thorax usually vittate above . . . . . **Helophilus**, 183

49.—Thickly pilose . . . . **Mallota**, 201

Thinly pilose 50

50.—Hind tibiæ of male with an internal median spur (plate viii, fig. 12) **Teuchocnemis**, 199

Hind tibiæ of male not with an internal median spur (plate ix, fig. 1) **Triodonta**. 205

51.—Hind femora thickened, with a bifid spur below on outer end, (plate xi, fig. 1). **Senogaster**, 238
Hind femora not with a bifid spur below 52
52.—Slender species, abdomen narrowed on basal portion . . . . . **Baccha**, 116
Abdomen in no wise club-shaped or narrowed basally 53
53.—Thorax with distinct yellow markings other than on the humeri . . . 62
Thorax not with distinct yellow markings other than rarely on the humeri 54
54.—Face transversely arched or carinate, not produced, not tuberculate; abdomen more or less elongate and nearly bare 55
More or less thickly pilose species, often large 57
55.—Hind femora extraordinarily thickened; anterior cross-vein rectangular (plate xii, fig. 1) . . . . **Syritta**, 239
Hind femora more or less thickened; cross-vein oblique 56
56.—Face sharply carinate (plate ix, fig. 2) . . . . **Tropidia**, 206
Face transversely arched (plate ix, figs. 5–8) . . . . **Xylota**, 224
57.—Scutellum, margin of the thorax, and the pleuræ with bristly hairs (plate xi, fig. 5) . . . . **Chrysochlamys**, 240
Thorax wholly without bristles 58
58.—Face short, not produced, concave from antennæ to tip, not tuberculate; hind femora thickened 59
Face produced, longer than the front 60
59.—Abdomen elongate . . . . **Brachypalpus**, 221
Abdomen very broad, thorax densely pilose, very large species (plate x, fig. 7) **Pocota**, 220
60.—Face produced forward, pointed, concave from antennæ to tip, not tuberculate, sub-carinate; hind femora thickened (plate x, figs. 4–6) . **Crioprora**, 217
Face not evenly concave, tuberculate or convex 61
61.—Third joint of antennæ produced above into a conical process, terminating in the thickened arista (plate xi, fig. 2) . . . . . . **Merapioidus**, 243
Third joint of antennæ obliquely oval; hind femora rarely thickened* (plates ix, x) . . . . **Criorhina**, 209
62.—Hind femora with a conical, tooth-like protuberance below, near the end (plate xii, figs. 3–5) . . . . **Spilomyia**, 224
Hind femora without such protuberance 63
63.—Antennæ inserted low down, near the middle of the head in profile; face not longer than the front (plate xii, figs. 6–7) . . . . . **Temnostoma**, 249
Antennæ situated high up, on a conical process, front short, face much produced downward; antennæ long or short (plate xii, fig. 8) . **Sphecomyia**, 258

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* If thinly pilose, with the abdomen nearly bare, and the hind femora thickened, see *Xylota tuberans*, p. 225.

PART II.

DESCRIPTIONS.

PART II.—DESCRIPTIONS.

MICRODON.

Microdon Meigen, in Illiger's Magazine, ii, 275, 1803.
Aphritis Latreille, Hist. Nat. Crust. et Ins., xiv, 1804.
Ceratophya Wiedemann, Auss. Zw. Ins., ii, 79, 1830.
Dimeraspis Newman, Ent. Mag., v, 372, 1838.
Mesophila Walker, List, etc., iv, 1157, 1849.
Ubristes Walker, Insecta Saunders., 217, 1856.

Rather large, nearly bare species, usually short, thick-set, with short wings. Head flattened, broad; the face rounded, pilose, not descending much below the eyes. Antennæ porrect, approximate at their base, elongate, divergent on outer part; first joint elongate, slender; second joint the shortest; third spindle-shaped, as long or longer than the first; arista short, basal, bare. Eyes usually bare, rarely pilose, broadly separated in the male, but less so than in the female. Thorax short, broad, convex. Scutellum large, flat or gently convex, often with a spine or tubercle on each posterior angle. Abdomen usually short and broad, turned downward, very convex, nearly bare. Legs short, rather stout, tibiae usually somewhat dilated; tarsi more or less dilated; the metatarsi elongated, especially the hind pair, which are sometimes extraordinarily dilated. Wings short, small; third vein nearly straight, first posterior cell long petiolate, with a stump of a vein projecting into it from the third vein, near its middle; last section of fourth vein, and the vein closing the discal cell, often with a stump of a vein on the inner side. Type of genus *M. mutabilis* Linné, Europe.

TABLE OF SPECIES.

1.—Slender, elongate species; antennæ short 2
Short, thick-set species 3
2.—Third joint of the antennæ a little shorter than the first two together; wings distinctly fasciate . . . . **baliopterus**
Third joint a little longer than the first two together, wings indistinctly fasciate . . . . **coarctatus**
3.—Hind metatarsi not, or but slightly, incrassate 4
Hind metatarsi strongly incrassate in the male 5
4.—Posterior part of the abdomen bright orange-yellow . . . . **pulcher**
Abdomen without orange-yellow . . . . **tristis**
5.—Third joint of the antennæ longer than the first . . . . **fuscipennis**
Third joint not longer than the first . . . . **globosus**

For other species see descriptions.

Microdon fuscipennis. (Plate I, figs. 1, 1*a*.)

Ceratophya fuscipennis Macquart, Hist. Nat. Dipt., i, 488, 3.
Microdon Agapenor Walker, List, etc., iii, 539.
Mesophila fuscipennis Walker, List, etc., iv, 1157.

Habitat.—Virginia, Florida!,* Texas (O. S.).

♂. Length, 6 to 8^{mm}. Head ferruginous red, clothed with yellowish white pile; in profile gently gibbose on the lower part of the face. Front broad, the distance from the ocelli to antennæ a little less than the least distance between the eyes; ocelli approximate. Antennæ red, elongate, the first joint considerably shorter than the two following together; second joint short; third joint a little longer than the first, obtuse at the tip, brownish on the distal part. Thorax red, the dorsum with three broad black stripes, the lateral ones abbreviated in front; clothed with short, light yellow pile. Scutellum large, plane, trapezoidal in shape, the length of the distal border not as great as the sides; very distinctly emarginate, the pile rather shorter than on the thorax. Abdomen short, broad, globose, brownish red, the pile short, light yellow. Legs red, the femora, except the tip, and sometimes a ring on the tibiæ, and the hind metatarsi, black; hind metatarsi longer than the remaining joints together, extraordinarily thickened and dilated. Wings tinged with blackish, especially in front and along the cross-veins; the sections of veins at outer part of first posterior and discal cells nearly straight and rectangular, somewhat deflected inward.

Three specimens, Virginia (T. Pergande), and Florida (Professor Riley).

The color probably varies more or less from red to brownish red throughout. I am not at all certain that this species is Macquart's *Ceratophyia fuscipennis*, as there is a distinct emargination on the border of the scutellum, the absence of which very character is that upon which the genus *Ceratophyia* was based.

Microdon globosus. (Plate I, fig. 2.)

Mulio globosus Fabricius, Syst. Antl., 185, 7.
Microdon globosus Wiedemann, Auss. Zw. Ins., ii, 86, 11 (translation from Fabricius); Packard, Guide, etc., 398, fig. 17; Lintner, 2nd Rep., 116, fig. 24.
Aphritis globosus Macquart, Dipt. Exot., ii, 2, 13, 5; tab. i, fig. 4.
Dimeraspis podagra Newman, Ent. Mag., v, 373.

Habitat.—Atlantic States !, Michigan (Lintner).

♂, ♀. Length, 8 to 10^{mm}. Antennæ red, somewhat blackish at the tip, the first joint a little shorter than the two following together; second joint not half as long as third; third joint pointed at the tip. Face thickly clothed with white pile; front in the male narrowed near its middle so that the distance from the ocelli to the antennæ is about twice the width; ocelli approximate; front in female as wide as the distance from ocelli to the antennæ. The color of the head is red; in profile the face is nearly parallel with the border of the eyes. Eyes bare. Thorax red, with three broad, indistinct, blackish stripes. Scutellum large, plane, trapezoidal in shape, the three sides nearly equal; wholly without spines or tubercles; pile short, reddish, not longer than on the dorsum of the thorax. Abdomen very short and broad, globose, brownish-red, the pile very short and whitish. Legs red, the femora more or less blackish; hind metatarsi longer than the three following joints together, very much dilated in the male. Wings brown along the front part and along the veins of the posterior part; veins at the outer part of the first posterior cell and discal cell nearly rectangular, not rounded on the posterior angles.

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* Habitats followed by an ! are given from specimens examined.

Numerous specimens.

Microdon pulcher, n. sp.

Habitat.—Saint Domingo !.

♀. Length, 12^{mm}. Eyes bare. Face nearly parallel in profile with the border of the eyes, shining black with a purple reflection, clothed with not very abundant white pile. Antennæ black, the first joint not quite so long as the two others together, second joint short, not a fourth as long as the third; arista shorter than the joint. Front deep shining purplish black, with short black pile. Thorax deep shining black, with a purple or violet reflection; pile short, black. Scutellum transverse, not half as long as broad, spines small and inconspicuous, remote from each other; pile longer than on the dorsum of the thorax, nearly white. The color of scutellum and the abdomen bright purple; third segment of the latter on the sides rather narrowly, fourth segment broadly, fifth segment wholly, orange yellow, and clothed with the same colored pile; elsewhere the abdomen is clothed only with short black pile. Legs black, the last joint of all the tarsi yellowish red; all the tarsi flattened transversely, the posterior metatarsi only a little thicker. Wings dark brown, the interior of outer cells subhyaline; the last section ot the veins at outer part of the first posterior and discal cells angulated and with stumps of veins.

Two specimens, Saint Domingo (G. F. Frazar).

Microdon baliopterus. (Plate I, fig. 4.)

Microdon baliopterus Loew, Centur., x, 56.

Habitat.—Texas (Lw.) !.

♂, ♀. Belongs among the species with slender body and short antennæ; fuscous bronze, moderately shining; front, thorax, and scutellum cupreous shining, abdomen greenish bronze in color, toward the sides becoming coppery; antennæ and legs testaceous, third joint of the former, and the basal half of the femora nearly wholly black fuscous; wings hyaline, veins usually broadly clouded with fuscous black. Length of body, 8 to 9^{mm}; of wings, 6 to 7^{mm}.

Related to *M. coarctatus*, and *lætus;* fuscous bronze, moderately shining. Front resplendent coppery, clothed with light yellow pile; face and occiput white pubescent. Eyes sub-nude. Antennæ short, saturate reddish; third joint a little shorter than the first two together, except the base, black. Thorax coppery-shining, the purplish stripes of the dorsum sub-opaque, pile of the dorsum sub-aureous, of the pleuræ white. Scutellum coppery shining, and sub-aureous pubescent. Color of the abdomen bronze-greenish, near the lateral margin in the male more obsoletely, in the female more distinctly, coppery, margin of the last segment nearly luteous. Abdomen subaureous pubescent, on the sides near the base with white pile, near the tip with black pile. Legs saturate testaceous or fuscous red; basal half of the femora always for the great part fuscous black. Tarsi sometimes fuscous. Wings cinereous hyaline, transverse veins and the anastomoses broadly clouded with fuscous black.

Translation from original, compared with the types in the Museum of Comparative Zoology.

Microdon coarctatus.

Microdon coarctatus Loew, Centur., v, 47.

Habitat.—District of Columbia (Lw.)!.

♂, ♀. Slender, steel green, moderately shining, eyes subnude, front and face narrow, ocelli remote from the vertex, antennæ short, black, margin of the second abdominal segment tumid. Length of body 7 to 8^{mm}, of wings 6^{mm}.

Slender, steel green, moderately shining, white pubescent. Front of equal width, in the female a little broader than in the male, ocelli remote from the vertex. Antennæ black, short, third joint a little longer than the first two together. Dorsum of thorax bronze green, very lightly punctulate and transversely aciculate, with four obscure coppery stripes. Scutellum greenish black, the apex emarginate and on each side provided with a black tooth. Abdomen in the male cylindrical, obtuse, in the female acute; second segment a little broader than the following, the disk depressed, with the lateral margins somewhat tumid. Wings cinereous hyaline, the transverse veins clouded with black, posterior angle of the first posterior and discal cells rounded, very shortly appendiculate.

Translation from the original, compared with the two type specimens in the Museum of Comparative Zoology.

Microdon tristis. (Plate I, figs. 3, 3*a*.)

Microdon tristis Loew, Centur., v, 45.

Microdon cothurnatum Bigot, Ann. Soc. Ent. Fr., 1883, 320 (var.).

Habitat.—Virginia, New York, and northward as far as the Mackenzie River (O. S.), Connecticut, Oregon!.

♀. Black, pallidly pilose, the antennæ long and fuscous black, front very broad, scutellum bidentate, abdomen oblong-ovate, the penultimate segment subequal to the two preceding. Length of body 9^{mm}, of the wings 6^{mm}.

Head bronze black, clothed with yellowish white pile, front very broad, of equal width. Antennæ elongate, black-fuscous, first joint linear, subequal to the third, testaceous at base. Thorax bronze black, obsoletely cupreous lineate, clothed with yellowish pile. Scutellum greenish black, white pilose, rather plane, with the apex emarginate and armed on each side with a minute tooth of the same color. Abdomen oblong-ovate, punctulate, black, the penultimate segment subequal to the two preceding together, with the base and lateral margins yellow pilose, and with the pile on the disk so arranged that a broadly interrupted fascia on the posterior margin of the third segment, two large separated spots on the fourth segment, two smaller subcontiguous ones on the fifth segment, clothed with white pile, are apparent. Venter yellow pilose, black piceous, with the posterior margin of each segment dilutely yellowish. Legs black piceous, base of femora, knees and basal half of hind tibiæ dilutely testaceous; tarsi neither dilated nor incrassate. Wings cinereous, clouds of the transverse veins narrowly blackish, posterior angle of the first posterior and discal cells rounded, not appendiculate.—Translation.

There is a considerable variation among the specimens which I have examined, and while, from an examination of the types in the Loew collection, I do not believe them specifically different, I deem it best to here give their descriptions.

♂, ♀. Length, 7 to 10^{mm}. Head metallic, shining green; face nearly parallel in profile with the border of the eyes, clothed with yellowish-white pile. Front, in the male, with a distinct transverse groove, in width a little less than the distance from the ocelli to the base of the antennæ, clothed with light-yellow pile; in the female the front is of the same width as the face, and the transverse depression is less distinct. Antennæ black, the first joint reddish at the base, third joint obtuse at tip, not as long as the first joint. Dorsum of thorax in the male shining brassy green, with an indistinct median stripe; in the female, more greenish blue; clothed with moderately long and abundant whitish pile. Scutellum gently convex, with an acute spine on each posterior angle; pile of the same color as on the dorsum of the thorax, a little longer and more abundant. Tegulæ white, with white pile on the margin. Abdomen more than twice as long as wide, bluish green, moderately shining, clothed with yellowish-white pile, which forms an indistinct, interrupted, transverse cross-band on the posterior part of the third segment, and two oblique spots on the fourth segment. Legs black; the tibiæ clothed with white pile; posterior metatarsi not quite as long as the remaining joints together, but little or not at all dilated. Wings only lightly tinged with blackish; the outer posterior angles of the first posterior and discal cells strongly convex.

Var. *ruficrus*, new.—A single male specimen from Connecticut seems to show a specific variation from the foregoing, but as one specimen is insufficient to decide it, I will here give the differences. The face is rather more projecting in profile below; across the front there is some black pile; the tibiæ and tarsi are wholly reddish-yellow; and the hind tibiæ and metatarsi seem to be more dilated.

Var. *cothurnatus* Bigot.—Two females and one male from Mount Hood, Oregon, agree very closely with the first two specimens, but the third joint of the antennæ is acute, the spines of the scutellum are very small, nearly obsolete; and the tibiæ and tarsi are wholly reddish-yellow.

Microdon limbus, n. sp.

Habitat.—Florida!

♀. Length, 9mm. Black, moderately shining. Face and front broad, parallel. Face clothed on the sides with golden pile, in the middle chiefly black. Antennæ dark brownish red, first and third joints of nearly equal length, the second more than a fourth of the length of the third. Front with only a little golden pile, mostly black, short. Dorsum of thorax black, with slight coppery reflections, nearly bare. Scutellum large, with two large, somewhat approximated spines. Abdomen broadly ovate, black, but little shining, the second segment on the sides behind, and the third with a larger oblique spot on each side, white pubescent or pilose. Legs dark red, the immediate base of the femora black, very short pilose; tibiæ rather stout, and gently convex on the outer side, especially the hind pair; hind metatarsi elongate, flattened, not dilated. Wings cinereous-hyaline in the inner part of the cells; all the veins, except the base of the fourth longitudinal, with a narrow, very distinct, blackish cloud on each side, those of the last vein separated by a subhyaline interval; outer cross-vein sinuous.

One specimen, Florida (National Museum, Professor Riley's collection).

Microdon, n. sp.

Habitat.—Mexico!

♀. Length, 10mm. A single imperfect specimen from the Isthmus of Tehuantepec, in the National Museum, shows such remarkable development of the hind tibiæ that I mention it here without giving it a name. It is yellowish red throughout, the dorsum of the thorax and the metanotum black. The hind tibiæ are extraordinarily dilated, crescentric in shape, considerably thickened, and with a dense fringe of black pile; the hind metatarsi are also dilated. The vertex projects strongly.

Microdon pachystylum, n. sp.

Habitat.—Georgia!

♂. Length, 6mm. First antennal joint not more than one-half the length of the third, reddish yellow; third joint much elongate, cylindrical, obtuse, more slender in its middle portion, dark brown; arista basal, much thickened and very short. Front and face broad, of equal width, the margins parallel, clothed with short, light-yellow pile; face in profile most projecting below, brownish red, shining. Dorsum of thorax black, shining, broadly reddish on the sides; pile short, whitish. Scutellum brownish red, small, oval, without spines or tubercles. Abdomen elongate oval, nearly bare, finely punctulate; second and third segments yellow; fourth elongate, black. Legs luteous yellow, the femora chiefly black; hind metatarsi elongate, somewhat thickened, scarcely dilated. Wings dark brown, less so behind. Cross-veins much inflected, sinuous, but without stumps.

One specimen, Georgia (National Museum, Professor Riley's collection). A female specimen from Texas differs in having the abdomen broadly oval, and nearly uniformly brown, the anterior segments luteous in the middle.

Microdon falcatus, n. sp.

Habitat.—Mexico!

♀. Length, 5^{mm}. Head flattened, vertex projecting, front descending. Front and face reddish yellow, shining, nearly bare. Antennæ elongate, black; first joint slender, second short, third longer than the first two together, thickened, curved falcate. Eyes bare. Thorax yellowish red, nearly bare; dorsum with three coalescent, black stripes, the outer ones abbreviated in front and behind, the middle one behind; scutellum very slightly emarginate behind. Abdomen red or brownish red, paler toward the base, very broadly oval, depressed, nearly bare. Legs black; hind tarsi scarcely dilated. Wings cinereous hyaline, strongly pubescent; the veins stout, nearly black; last section of the fourth vein inflected, posterior cross-vein sinuous.

Four specimens, Isthmus of Tehuantepec (National Museum, Professor Riley's collection.)

Microdon aurifex.

> *Microdon aurifex* Wiedemann, Auss. Zw. Ins., ii, 85; Macquart, Dipt. Exot., ii, 2, 11, 2, tab. ii, fig. 2.
>
> ? *Microdon trochilus* Walker, Dipt. Saunders., 216.

Habitat.—Mexico!, Brazil (Wied.).

♂. Length, 10^{mm}. Bright metallic green with violaceous reflections; tip of the abdomen yellow; legs black. Antennæ blackish brown, first and third joints of nearly equal length. Face rather narrow, moderately swollen, white pilose. Front with black pile, considerably narrowed in the middle, where its breadth is less than half the distance between antennæ and ocelli. Eyes sparsely pilose. Dorsum of thorax with moderately abundant erect black pile; in front and on the sides, with sparse, light yellow pile. Scutellum large, trapezoidal, covered with light yellow pile; spines small and remote. Abdomen less violaceous than the thorax, nearly bare; first segment with yellow pile; second with an anterior opaque black cross-band; hypopygium wholly reddish yellow, not shining. Legs black, with a greenish reflection, especially on the hind pair; pile black, rather long, fringed on the outer side of the tibiæ, particularly of the hind pair; hind tarsi considerably dilated. Wings nearly uniformly cinereous; posterior cross-vein not much inflected, without stump.

One specimen, Isthmus of Tehuantepec (National Museum, Professor Riley's collection). This species must resemble *M. aurulentus*, but there are differences from Fabricius's brief description, as Wiedemann pointed out, and especially from Macquart's, who it may be supposed examined the type in Bosc's museum at Paris. It is also evidently related to *M. inequalis* Loew, but differs especially in the pile of the thorax.

Microdon scitulus, n. sp.

Habitat.—Florida!

♂. Length, 6mm. Bright metallic green and steel blue. Head hemispherical. Front and face steel blue, narrow, the former lightly emarginate on the sides, with short black pile, the least width less than the distance from anterior ocellus to base of antennæ; face but little projecting in profile, thickly white pilose; antennæ black; third joint a little longer than the first, a little broader on its outer part; arista slender. Eyes bare. Dorsum of thorax with strong steel blue reflections, thinly pilose. Scutellum subtriangular, spines moderately stout, approximate. Abdomen brilliant green, uniform, with fainter blue reflections, finely punctulate, elongate oval, on the sides with oblique spots and on the end white pubescent. Femora, except the tip, metallic green, tibiæ yellow, tarsi more luteous. Wings nearly uniformly subinfuscated; outer cross-veins rectangular and straight.

One specimen, Florida (National Museum, Professor Riley's collection). This species might be identified as *M. rufipes* Macq. were it not for the discrepancies in the pile of the eyes, face, and front.

Microdon marmoratus.

Microdon marmoratum Bigot, Ann. Soc. Ent. Fr., 1883, 320.

Habitat.—California (Bigot).

♂. Long., 9mm. *Obscurè fuscum, flavo pallido satis dense tomentosum. Antennis fulvis, apice plus minus infuscatis; fronte et facie fuscis, lateribus obscurè testaceis; abdomine utrinque, latè, plus minus fulvo tincto; pedibus fulvis, femoribus basi, annulo tibiarum, tarsorum posticorum segmento basilari, nigris; alis cinereis, apice obscurioribus, venis fusco limbatis.* ♀. *Simillima. Fronte et facie rufis.*

♂. D'un brun foncé, assez densément couvert d'un duvet velouté fauve clair, plus abondant sur le thorax; antennes d'un fauve plus ou moins foncé, souvent brunâtres vers leur extrémité; face et front bruns; thorax rougeâtre sur les côtés, écusson plus ou moins roussâtre; cuillerons et balanciers d'un testacé pâle; abdomen souvent un peu roussâtre sur les côtés; pieds fauves, base des cuisses largement noire, un anneau au milieu des tibias, et, base des tarses postérieurs, de même couleur; ailes grises, légèrement enfumées au bord externe et à l'extrémité, nervures largement bordées de brunâtre. ♀. Semblable au ♂. Face et front rougeâtres. Californie.—4 ♂, 3 ♀.—Bigot, l. c.

♂. Dark brown, densely clothed with clear fawn-colored velvety pile, more abundant on the thorax; antennæ more or less dark fawn-colored, often brownish near their extremity; face and front brown; thorax reddish on the sides; scutellum mere or less reddish; tegulæ and halteres pale testaceous; abdomen often somewhat reddish at the sides; legs fawn-colored, base of femora largely black, a ring in the middle of the tibiæ, and the base of the hind tarsi, of the same color; wings gray, distinctly clouded on the posterior part and at the tip, veins largely bordered with brown. ♀. Like the male, face and front reddish.—Translation.

Microdon fulgens.

Microdon fulgens Wiedemann, Auss. Zw. Ins., ii, 82, 1.
Aphritis fulgens Macquart, Dipt. Exot. 1er Suppl., 122.
Microdon euglossoides Gray, in Griffith's Animal Kingdom, ii, tab. 125, fig. 2. (Walker, List, etc., iii, 538).

Habitat.—Georgia (Wied.), Florida, Guiana (Macq.).

Viridaureus, alis fuscanis. 15mm, ♀.—Georgia.

Fühler schwarz. Untergesicht stahlblau, dünn gelblichweiss behaart. Mittelleib grüngolden, in gewisser Richtung erscheinen darauf fast kupferrothe Striemen. Vorflügeldreieck stahlblau. Stirn zwischen grün und stahlblau. Flügel fast rein braun, doch an den dünnen Rändern nur bräunlich; Schüppchen weiss, mit schwarz gewimpertem Rande. Beine grün oder blau.—Wiedemann.

Antennæ black. Face steel blue, thinly yellowish white pilose. Thorax green-golden, in certain reflections there appear copper-red stripes. Ante-alar callosity (Vorflügeldreieck) steel blue. Front between green and steel blue. Wings nearly pure brown, on the thin veins only brownish; tegulæ white, with a black ciliate border. Legs green or blue.—Translation.

Microdon aurulentus.

Mulio aurulentus Fabricius, Syst. Antl., 185, 8.
Microdon aurulentus Wiedemann, Auss. Zw. Ins., ii, 86, 10.
Aphritis aurulentus Macquart, Dipt. Exot., ii, 2, 12, 4; pl. ii, fig. 1.

Habitat.—Carolina (Fabr.).

Viridi æneus, auro tomentosus. Twice as large as M. globosus. Antennæ black. The entire body bronze-green, clothed with thick golden pile. Legs black.—Translation from Fabricius.

♀. Long. 8mm. Face et front à poils jaunes. Antennes noires; premier article un peu plus long que dans les espèces européenes et au moins autant que les deux autres réunis. Thorax à poils jaunes; écusson et abdomen à poils d'un fauve doré plus ou moins absens; pieds noirs; jambes à duvet fauve. Balanciers fauves. Ailes brunâtres. De la Caroline. Bosc's Muséum.—Macquart.

Face and front with yellow pile. Antennae black, first joint a little longer than in the European species, and a little shorter than the two others together. Thorax with yellow pile; scutellum and abdomen with pile of a golden luteous color more or less wanting; legs black; tibiæ with luteous colored pile. Tegulæ luteous colored. Wings brownish.—Translation.

Macquart's description was based upon the type specimens of Fabricius, at Bosc's museum, Paris.

Microdon rufipes.

Aphritis rufipes Macquart, Dipt. Exot., ii, 2, 11, 1; pl. ii, fig. 3.
Microdon rufipes Osten Sacken, Catalogue, 119.

Habitat.—Philadelphia (Macq.).

Thorace nigro-viridi, purpuro-lineata. Abdomine nigro-cœruleo, albido tomentoso. Pedibus testaceis. Long, 6^{mm}.

Face d'un vert noirâtre, à poils jaunâtres. Front d'un bleu noirâtre à poils jaunâtres; un sillon transversal. Antennes: premier article noirâtre; les deux autres testacés. Yeux peu velus. Thorax à quatre lignes pourpres sur un fond vert métallique noirâtre; écusson bleu; pointes couvertes de poils blanchâtres. Abdomen ovale, d'un bleu violet foncé; deuxième segment à bande transversale de duvet blanchâtre au bord postérieur, interrompue au milieu et s'élargissant vers les côtés; troisième à bande longitudinale de semblable duvet, également interrompue et se réunissant à l'extrémité. Pieds d'un fauve testacé; base des cuisse noire. Balanciers jaunâtres. Ailes à base et bord extérieurs jaunâtres; toutes les nervures bordées de brunâtre; première cellule postérieure terminée en angle et appendiculée.—Macquart.

Face of a blackish green, with yellowish pile. Front blackish blue, with yellow pile, with a transverse groove. Antennæ: first joint blackish; the two others testaceous. Eyes thinly pilose. Thorax with four purple lines on the metallic blackish green ground color; scutellum blue; points covered with whitish pile. Abdomen oval, of a dark violet blue; second segment with a band of whitish pile on the posterior border, interrupted in the middle and enlarged at the sides; third segment with a longitudinal stripe of similar pile equally interrupted and reunited at the extremity. Legs reddish colored, base of femora black. Halteres yellowish. Wings at base and exterior front border yellowish; all the veins bordered with brownish; first posterior cell terminating in an angle and appendiculate.—Translation.

The figure represents the last section of the fourth vein as straight and rectangular, the posterior angle a little acute and appendiculate.

ADDITIONAL NORTH AMERICAN SPECIES.

Microdon inaequalis Loew, Centur., vii, 70.—Cuba.
Microdon laetus Loew, Centur., v. 46.—Cuba.
Microdon gracilis Bigot, Annales Soc. Ent. de France, 1883, 320.—Mexico.
[*Chymophila splendens* Macquart, Hist. Nat. Dipt., i, 486, pl. xi, fig. 3; Dipt. Exot., ii, 2, 10, 2, pl. i, fig. 2.—Phila.

"Mr. Bigot, in whose possession the typical specimen of Macquart's description now is, makes the following statement about it (Annales Soc. Ent. de France, 1858, p. 590): 'The head of this specimen is glued on, and resembles that of Conops, while the body is that of an exotic Microdon.' We may with safety, therefore, strike out the genus and species from among the number of existing forms." Osten Sacken, Bull. Buff. Soc. Nat. Sci., Nov., 1875.

"Since writing the above I have seen the specimen and can only confirm the statement. The body seems to belong to *Microdon aurifex* Wiedemann." Osten-Sacken, Cat. Dipt., 243.]

CHRYSOTOXUM.

Chrysotoxum Meigen, in Illiger's Magazine, ii, 259, 1803.

Rather large, thinly pilose, or nearly bare species, black, with bright yellow markings on head, thorax, and abdomen. Head as broad or scarcely broader than the thorax. Antennæ elongate, longer than the head, porrect, situated upon an obtuse prominence; first two joints of nearly equal length, the third elongated, spindle-shaped, before the middle with a thin, small, bare arista. Face broad, descending somewhat below the eyes, below the antennæ gently excavated in profile, and with an obtuse tubercle on lower third. Eyes pilose (in some exotic species bare), contiguous in the male. Abdomen more than twice as long as the thorax, beyond the middle broader than the thorax, elliptical, strongly arched, with thin lateral borders; hypopygium usually concealed. Legs comparatively weak, hind femora elongate, hind metatarsi as long as the remaining joints together. Third longitudinal vein of the wings with a distinct curvature into the first posterior cell; first posterior cell closed near the border of the wing; small cross-vein a little before the middle of the discal cell, a little oblique.

In addition to these structural characters, the species show a remarkable resemblance of coloration, which I give here to save repetition.

Face and cheeks yellow, the former with a black stripe running from the base of the antennæ to the oral margin, the cheeks also with a black stripe from the eye to the mouth. Antennæ black; frontal triangle with a black spot above the base of the antennæ; front in female black, with a cross-band near the middle of whitish pollen. Thorax black, but little shining; on each side, with a yellow interrupted stripe; in the middle with a pair of slender, whitish pollinose stripes, obsolete behind. Scutellum yellow, across the disk more or less translucent dark colored. Pleuræ with one or more yellow spots. Abdomen black, but little shining; second segment with an arcuated, interrupted cross-band; each of the following with an arched, anterior cross-band, and the posterior border, yellow. Legs yellow, sometimes the femora more or less blackish at the base. Wings nearly hyaline, with an anterior brownish border.

This genus has always been more or less of a problem to dipterologists. The characters that seem to distinguish the species are hard to describe. The lengths of the joints of the antennæ offer characters of some value, but I feel sure that they are not so reliable as some authors have supposed. In a rather large series of specimens, all apparently belonging to the same species, I find a very considerable variation in the length of the third joint, as will be seen in figure 5*a*, plate I.

TABLE OF SPECIES.

1.—The lateral margin of the third abdominal segment yellow 2
  The lateral margin not yellow 3
2.—The black on the fifth abdominal segment is shaped like an inverted V. **laterale**
  The black has the two posterior branches arcuate, and widely separated at the tips . . . . **ypsilon**
3.—Arcuate bands of abdomen entire; the black spot on the fifth segment is elongated and narrow, with the branches nearly parallel . . . . **integre**
  Arcuate bands interrupted 4
4.—Eastern species 5
  Western species . . . . **derivatum**
5.—Black spot of the fifth abdominal segment inverted Y-shaped . . **ventricosum**
  Black spot, etc., inverted V-shaped . . . . **pubescens**

Chrysotoxum laterale.

Chrysotoxum laterale Loew, Centur., v, 42.

Habitat.—New York!, Nebraska (Lw.).

♂. Length, 11$^{\text{mm}}$. Second joint of antennæ a little longer than the first; third joint a little longer than the first two together; eyes pilose. Lateral stripes of the thorax sub-entire; the white vittulæ conspicuous. Scutellum yellow, the disk black fasciolate. Yellow fasciæ of the abdomen arcuate, very narrowly interrupted, connected with the yellow border of the lateral margins; posterior margin of each segment yellow; on the 'first' segment narrowly, on the third broadly, on the fourth strongly dilated, on the fifth produced into an oblong spot, so that between this spot and the fascia the black forms an inverted Y. Hypopygium yellow. Each of the middle segments of the venter with narrow abbreviated yellow fascia on the posterior margin. Legs wholly yellow. Wings cinereous hyaline, costa with a narrow fuscous cloud of equal width. From *C. derivatum* Walker, to which this is nearly related, it will be easily distinguished by the thoracic stripes being broader, by the margin of the abdomen being yellow, by the picture of the venter being different, and by the legs being wholly yellow.—Translation.

A single female from New York (August 25) I identify as this, but the first segment of the abdomen does not have a posterior yellow margin.

Chrysotoxum ypsilon, n. sp.

Habitat.—New Mexico!.

♂. Length, 10 to 12$^{\text{mm}}$. Large. Third joint of the antennæ longer than the other two together. Scutellum on its disk dark and translucent. Arcuate bands of abdomen rather broad, connected with the yellow of the posterior margin behind. Margin of the abdomen from the second segment yellow; the black spot on the fifth segment is slender, forming three arms; the basal one is short, formed by the interruption of the arcuate band; the two posterior are curved outwardly, so that the distance between the tips is about the same as the length of each. Legs yellow. Wings with a narrow brown border in front.

Three specimens, New Mexico (G. F. Gaumer), from Mr. Eugene Keen.

Chrysotoxum pubescens.

Crysotoxum pubescens Loew, Wien. Ent. Monatschr., iv. 84; Centur., v. 43.

Habitat.—Illinois (Lw.), New York !.

♂, ♀. Length, 12.5^{mm}. Second joint of the antennæ longer than the first; the third joint in the female subequal to the two preceding together; in the male longer. Eyes pilose. Lateral stripes of the thorax interrupted; the median vittulæ conspicuously whitish pollinose. Scutellum yellow, the disk black. The yellow fasciæ of the abdomen of moderate width, arcuate, interrupted, on the posterior angles of the segments connected with the posterior bands; these hind margins on the posterior segments are broader than on the anterior segments, on the last segment dilated into a triangular spot between which and the fascia the black forms an inverted V. Venter black, posterior margin of the segments yellow; the two intermediate in the male, the last three segments in the female, each with two ovate yellow spots. Hypopygium yellow. Legs yellow. Wings cinereous; near the costa, lutescent.

Translation, compared with the types. Specimens agreeing with this I have seen from New York.

Chrysotoxum ventricosum.

Chrysotoxum ventricosum Loew, Centur., v, 44.

Habitat.—District of Columbia (Lw.), Canada!

♀. Eyes pubescent, scutellum wholly yellow, abdomen globose, with fasciæ of moderate width, moderately arcuated, narrowly separated or subseparated from the lateral margin; base of the front and middle femora, and the hind femora except the tip, black. Length of body, 10^{mm}; of the wings, 10.5^{mm}.

Third joint of the antennæ a little longer than the other two together. Eyes pilose. Lateral stripes of the thorax interrupted Scutellum wholly yellow. Abdomen globose, fasciæ of moderate width, moderately arcuate, narrowly interrupted, usually separated from the lateral margins, and from the posterior margin, sometimes, by the luteous spot in the posterior angles, joined with them; posterior margin of the first segment with a narrow yellow band, or without it; posterior bands of the remaining segments of moderate width, the last dilated into a triangular spot, separated from the fascia by a black, inverted V-shaped spot. Last three segments of the venter each with a yellow fascia on the posterior margin. Legs yellow; base of the front and middle femora, and the hind femora except the tip, black. Wings cinereous, along the costa fuscous.

C. ventricosum differs from *C. arcuati*, to which it is nearly allied, in the base of the abdomen being black pilose.—Translation.

I have seen a specimen from Canada which I believe belongs here.

Chrysotoxum derivatum. (Plate I, figs. 5, 5*a*, 5*b*, 5*c*.)

Chrysotoxum derivatum Walker, List, etc., iii, 542.

Chrysotoxum villosulum Bigot, Ann. Soc. Ent. de Fr., 1883, 323.

Habitat.—Hudson's Bay Territory, Alaska, Colorado Mountains (O. S.), California, Oregon!

♀, ♂. Length, 10 to 14^{mm}. Second joint of the antennæ a half or a third as long as the third; eyes pilose. Pile of thorax black and yellow. Bands of the abdomen rather slender; first band separated by a considerable distance from the border, which is not yellow; the band is usually connected with the posterior angles of the segment by a small yellow spot; third segment with the arcuated cross-band of nearly equal width throughout, narrowly interrupted in the middle, touching, or narrowly separated at the posterior angles from the yellow hind margin; the hind cross-band usually reaches quite to the lateral margin, usually slender, more or less dilated in the middle; fourth segment similar, but the arcuate band broadly connected at the outer angles with the broad hind margin; the posterior band is considerably widened at the middle, so that between the two bands there is inclosed an arched, elongated black stripe; fifth segment with the yellow inclosing an inverted V-shaped spot.

In some specimens, both male and female, the pile on the sides of the base of the abdomen is in large part black; the arcuate band of the fourth segment is entirely separated from the yellow of the hind margin. Nine specimens.

Chrysotoxum integre, n. sp.

Habitat.—Arizona!

♀. Length, 10^{mm}. Third joint of the antennæ longer than the first two together. First arcuate band of abdomen narrowly interrupted, connected with the yellow of the posterior angles, hind margin of the segment narrowly yellow in the middle; arcuate band of the third segment entire, connected with the yellow of the hind margin; anterior angles yellow, posterior marginal band angularly dilated in the middle; fourth segment similar, the arcuate band more convex, the posterior band more dilated, nearly cutting the black in two; arcuate band of the fifth segment entire, shaped like an inverted U, the yellow of the posterior margin dilated, forming an elongate narrow stripe, between which and the arcuate band the slender black forms an elongate inverted U. Legs yellow. Wings narrowly brown along the front margin.

ADDITIONAL NORTH AMERICAN SPECIES.

Chrysotoxum nigrita (Fabr.) Wiedemann, Auss. Zw. Ins., ii, 88, 2.—Jamaica.
Syrphus nigrita Fabricius, Ent. Syst., iv, 292, 49.
Mulio nigrita Fabricius, Syst. Antl., 183, 1.

Chrysotoxum flavifrons Macquart, Dipt. Exot., ii, 2, 17, 2; tab. iii, fig. 2.—Newfoundland.

It will be *impossible* to determine this species from the description given by Macquart. For this reason I consider it merely as a catalogue name, that should be dropped.

PARAGUS.

Paragus Latreille, Dictionn. l'Hist. Natur. Déterville, vol. xxiv; Hist. Nat. des Crust. et Ins., xiv, 359, 1804.

Small, nearly bare, rather short species, with the abdomen curved downward at the tip, of a black or greenish black color, with yellow on the face and usually more or less reddish on the abdomen. Head hemispherical, somewhat flattened, broader than the thorax. Antennæ about as long as the head, directed forward; first and second joints short, third longer than the first two together, rather slender, arista before the middle, bare. Face in profile somewhat projecting below, convex, with an obtuse tubercle. Eyes pilose, narrowly contiguous in the male. Abdomen as wide as the thorax and of nearly equal width throughout, gently convex above, twice or more as long as the thorax, with a shallow transverse depression on each segment, the distal end bent downward. Legs moderately slender, the hind metatarsi much thickened, as long as the remaining joints together. Marginal cell of wing open; third longitudinal vein straight, anterior cross-vein near the base of discal cell, the last section of fourth vein sinuate, terminating in the third vein in nearly a right angle, at a considerable distance before the tip.

TABLE OF SPECIES.

1.—Scutellum with a yellow border; face of male without a black median stripe; front of female narrow above . . . . **bicolor**
Scutellum without a yellow border; face in both sexes with a black median stripe; front in female of nearly equal width **2**
2.—Abdomen with more or less red on the dorsum **3**
Abdomen wholly greenish black . . . . **angustifrons**
3.—Vertical triangle in male large . . . . **tibialis**
Vertical triangle not unusually large . . . . **dimidiatus**

Paragus angustifrons.
Paragus angustifrons Loew, Centur., iv, 64.

Habitat.—Atlantic States!

♀. Length, 5mm. Head shining, somewhat metallic black, front narrow, immaculate, face nearly perpendicular, but very little projecting, yellow on the sides. Antennæ black, third joint reddish below. Pile of the face white, of the front blackish, of the vertex luteous. Dorsum of thorax clothed with very short, sublutescent pile, in front obsoletely cinereous bilineate. Scutellum of the same color as the thorax, the extreme apex testaceous. Abdomen wholly greenish black, white pubescent. Legs yellow and ochraceous varied; femora, on the basal half of the front and middle pairs, and the hind tarsi, except the tip, black; tip of hind tibiæ and the hind metatarsi fuscous. Wings hyaline; stigma luteous.—Translated from original.

A single female specimen from Professor Riley agrees almost perfectly with this, except that the dorsal stripes of the thorax are very distinct, a character, however, that is very variable in species of this genus. I can see no structural differences between this and *P. bicolor*.

Paragus bicolor. (Plate I, figs. 7, 9.)

Syrphus bicolor Fabricius, Entom. Syst., iv, 297, 71, 1794.

Mulio bicolor Fabricius, Syst. Antl., 186, 10.

Paragus bicolor Latreille, Gen. Crust., xiv, 359; Meigen, Syst. Beschr., iii, 178, 2 (var.); Macquart, Hist. Nat. Dipt., i, 565, 2 (var.); Zetterstedt, Dipt. Scand., ii, 849, 1 (var.); Schiner, Verh. Zool. Bot. Ges., vii, 301; id. Fauna Austr., i, 259.

Paragus testaceus Meigen, Syst. Beschr., iii, 180, 6 (var.).

Paragus arcuatus Meigen, l. c., iii, 179, 3 (var.).

Paragus punctulatus Zetterstedt, Dipt. Scand., ii, 850, 2.

Paragus tæniatus Meigen, l. c., iii, 179, 4 (var.).

Paragus ruficauda Zetterstedt, l. c., 852, 5.

Habitat.—North America, Europe!.

♂ ♀. Length, 4 to 6^{mm}. Eyes with a distinct vertical glabrous stripe. Face of male wholly pure light sulphury yellow, the oral margin and cheeks shining black; in the female there is a shining black stripe reaching from the antennæ to the oral margin. Antennæ blackish; the under side of the third joint red. Front of the female narrowed above, so that at the vertex it is not more than half as wide as at the base of the antennæ; shining black, lightly dusted on the sides below; frontal triangle yellow, the eyes scarcely touch each other at a point midway between the ocelli and base of the antennæ; vertical triangle black, light pollinose in front. Thorax black, a little shining, with light yellowish pile, in front with two whitish pollinose stripes. Pleuræ silvery white pilose. Scutellum with a whitish yellow border, not extending to the anterior angles. Abdomen chiefly red, but variable in color; first segment, black; second segment, often wholly black, sometimes more or less red behind, sometimes only black on the sides. The black usually extends narrowly along the sides of the third segment, sometimes of the fourth and fifth also; rarely the third segment has a blackish band. Pile on the sides of the segments in front and on the lateral margins, and on the fifth segment, white, elsewhere obscure. Legs variable, frequently the basal portion of the front and middle femora, and the hind femora except the tip, are black; sometimes, also, there is a black ring on the hind tibiæ, and the hind metatarsi also black; often the black is wholly wanting, the legs are then yellowish red with the tip of the femora and the base of the tibiæ light yellow. Wings, nearly hyaline; stigma, dilutely yellow.

Ten specimens from Montana (Professor Comstock); one from Garland, Colo. (Professor Riley); one from Como, Wyo.; two from Washington Territory; one from Southern California; and four from Connecticut. The species is very variable. In Europe there has been much confusion, as will be seen from the list of synonyms, which I have reproduced from Schiner. To this author our knowledge of the variations is chiefly due, and hence the following translation of his description and remarks will be valuable: "Abdomen black; in the middle in greater or less extent, yellowish red. When the black is confined to the base of the abdomen, the first segment, at least, is always black, or, in the middle behind, there may be a small red spot, and the black color does not here appear spotted. Ground color metallic black or dark bronze green. Dorsum of thorax with two median stripes reaching nearly to the middle, sometimes wholly wanting. Antennæ brown. Abdomen, except the base, wholly yellowish red (var. *testaceus*); or yellowish red with the base and tip black, and on the third and fourth and fifth segments with white pilose arcuated spots (var. *arcuatus* and *bicolor*); or with these pilose spots wanting (var. *taeniatus*); or the reddish color is confined to tip (var. *ruficauda*), in which case the scutellum is wholly black. The legs are yellow with the base of the femora black, sometimes with a black ring on the hind tibiæ, and with darkened meta tarsi.

"A careful examination of my rich material has given me no better results than the above. It is difficult to believe that the long, slender varieties, four millimeters in length, and the robust specimens, six millimeters in length, should belong to one and the same species, and yet we find between these extremes, numerous connecting forms. The color has no value, plastic differences are wholly wanting; specimens occur in which differences of neuration exist in the two wings of the same individual.*

"Specimens have been taken in copula of *P. bicolor* and *P. testaceus*, *P. testaceus* and *P. tæniatus*." †

Paragus tibialis. (Plate I, fig. 8.)

Pipiza tibialis Fallen, Dipt. Suec. Syrph., 60, 5.
Paragus hæmorrhous Meigen, Syst. Beschr., iii, 182, 10.
Paragus æneus Meigen, l. c., 183, 11; Zetterstedt, Dipt. Scand., ii, 854, 8.
Paragus obscurus Meigen, l. c., 183, 12.
Paragus tibialis Meigen, l. c., 183, 13; Zetterstedt, Dipt. Scand., ii, 852, 6.
Paragus femoratus Meigen, l. c., 184, 14.
Paragus trianguliferus Zetterstedt, Dipt. Scand., ii, 853, 7.
Paragus sigillatus Curtis, Brit. Ent., 593.

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* Fauna Austr. i, 259.

† Verh. Z. B. Ges., vii, 301.

Paragus nigritis Gimmerthal, Bull. d. Moscou, xv, 668.
Paragus albipes Gimmerthal, l. c.
Paragus dispar Schummel, Arb. u. Veränd. d. Schles. Ges., 1842, 163.
Paragus coadunatus Rondani, Nuovi Ann. d. Sc. Nat. di Bologna, 1847, 182, 10.
Paragus tibialis Schiner, Fauna Austr., i, 257.
Paragus auricaudatus Bigot, Annales Soc. Ent. Fr., 1884, 540.

Habitat.—Europe, North America!.

♂ ♀. Length, 3 to 5mm. Very variable in size and color in the numerous varieties, between which there are frequent connecting forms. Wholly black or black green (var. *obscurus*, *femoratus*, and *tibialis*), or black with the tip of the abdomen reddish yellow (var. *hæmorrhous* and *æneus*), or black with reddish yellow triangular spot on the third segment (var. *triangulatus* and *sigillatus*), or black with the last three segments yellowish red, the antepenultimate one, however, wholly or partly black. Antennæ as long as the head, or somewhat shorter, at the base usually blackish brown, the third joint of the same color, often lighter below, and sometimes on the under side yellowish brown. Face on the sides yellow, in the middle broadly shining black, on the lower part somewhat projecting, and a small but distinct tubercle above the oral margin. Legs light yellow, black on the base of the femora; sometimes the black comprises the whole of the hind femora, except the tip; sometimes also the hind tibiæ have a black or brown ring, or their tip is brown. Scutellum wholly black. Wings hyaline, slightly grayish yellow tinged.—Translation from Schiner, Fauna Austriaca.

I have several specimens from New England and California, in which I can detect no difference from specimens from Europe.

Paragus dimidiatus.

Paragus dimidiatus Loew, Centur., iv, 63.

Habitat.—District of Columbia (Lw.)!

♂, ♀. Length, 3 to 4.25mm. Shining black-green; scutellum without yellow. Face yellow, moderately projecting, with a median stripe in both sexes. Legs yellow and ochraceous; basal half of femora black. Three segments of abdomen in the male ochraceous red. Wings hyaline; stigma very dilutely subfuscous. Very similar to *P. tibialis*, var. *hæmorrhous*, but the vertical triangle is less broad, the face less projecting, and the pile of the whole body somewhat shorter. Third antennal joint sordid reddish below. Abdomen of the female wholly black-green, of the male with the first two segments black-green, the following ones ochraceous red. As the picture of the abdomen in *P. tibialis* is very variable it is probable that the same variability may be found in this species.—Translation from original.

The structural differences given for this species may justify its separation from *P. tibialis*, but in the examination of a considerable material which I have compared with specimens of this latter from Europe I have not been able to satisfy myself of differences sufficient to justify specific separation.

NAUSIGASTER.

Nausigaster Williston, Trans. Amer. Ent. Soc., xi, 33, 1885.

Moderate sized, nearly bare species, black in ground-color, but thickly pollinose, with shining, numerous small black punctulate spots. Head spheroidal, broader than the thorax. Eyes bare, contiguous in the male. Front narrowed above, evenly arched to the antennæ, which are situated a little above the middle of the head in profile. Face narrowed below, concave on upper part below the antennæ; the tubercle near the middle large, obtuse, below it much receding to the oral margin, resembling in structure the species of *Paragus*, but more concave above the tubercle and more receding below it, the tubercle being higher up. Cheeks narrow. First and second joints of the antennæ extremely short, so that the third joint appears sessile, the latter thickened, large, subquadrate, as broad as long, the angles rounded, and narrower on the basal portion; arista small, bare, very short, not as long as the third antennal joint, remote from the base, situated upon the anterior rounded angle near the end of joint. Scutellum small, convex, but thinned along its margin. Abdomen very convex above, beyond the middle being in cross-section two-thirds of a circle; first segment short; second segment moderately long; third segment much shorter than the second in the middle, on the sides about as long, the incisure in front forming a deep stricture, less evident behind; fourth segment very large, as long as the three preceding together, forming half of an ellipsoid, flattened on one side, the strongly convex end extending beyond the anal opening, and wholly concealing the following segments. The sides of the abdomen are directed downward and inward, inclosing toward the outer part of the venter a deep cavity, shallower on the second and third segments; at the posterior part of this cavity, and concealed by the posterior rim, is the anal opening looking obliquely forward; back of the anus on the rim on each side is a small obtuse membranous flap or process. Hypopygium small, wholly concealed. Legs as in *Paragus*—rather short and moderately strong, the hind metatarsi thickened. Wings more like those of *Syritta* than of *Paragus*. The first longitudinal vein joins the costa a little before the tip of second vein, and then by a curve at the tip, so that the vein runs parallel to the costa for some distance. The anterior cross-vein is near the basal third of discal cell, and the third vein beyond is gently bisinuate. The last section of the fourth vein is sinuate like it is in *Syritta*, but more deeply so, the vein terminating very near the costa, but forming nearly a right angle at its juncture.

Type of genus, *N. punctulata* Williston, N. America.

Nausigaster punctulata. (Plate I, figs. 10, 10*a*.)

Nausigaster punctulata Williston, Trans. Amer. Ent. Soc., xi, 34; pl. ii, fig. 15.

Habitat.—New Mexico, California, Mexico!

♀. Length, 12^{mm}. Black, moderately shining, everywhere, except on legs and venter, covered with whitish pollen, which, when not rubbed, leaves very numerous, nearly contiguous circular black spots, more abundant on the thorax; on the dorsum of thorax and abdomen the ground color of the moderately shining punctulate black surface may be in large part denuded. In the middle of the thoracic dorsum is a pair of indistinct, less pollinose stripes. Antennae wholly yellowish red; the cheeks and the lower part of the face obscurely yellowish, in the middle of the face below the antennæ there is an oval space which is evenly pollinose, free from the black dots. Wings hyaline, with two conspicuous blackish spots; the larger one beginning in the subcostal cell at tip of auxiliary vein, thence more broadly along the marginal cell, the base of the submarginal cell for a third of its length, and less distinctly opposite this on the cross-vein and base of first posterior cell; the smaller spot reaching from the tip of the first longitudinal vein nearly to the third; veins black, brown toward the base. Legs yellowish red; the front femora on basal half, and the other femora, except the tips, black; the front and hind tarsi brown.

♂. Five male specimens have the dorsal stripes more apparent, there being three with two others between them less apparent; the legs are darker, the tarsi blackish; the wings are hyaline, except a small blackish spot on the stigma reaching across to the third vein.

One female, New Mexico (Morrison), and five males, California (Coquillett).

Since writing the above I have received a number of specimens, both male and female, from Mr. Coquillett, of California, and I find them all agreeing with the males above described. They are all smaller than the type specimen, and differ in the wings having only the one spot, instead of two, as in the original female. A male specimen in the National Museum, from the Isthmus of Tehuantepec, has the abdomen narrower, with coppery reflections where denuded. Both the legs and the spots on the wings are darker than in the type, and the latter are connected through nearly the whole length of the submarginal cell.

PIPIZA.

Pipiza Fallen, Dipt. Suec. Syrph., 58, 1816.
Heringia Rondani, Dipt. Ital. Prodr., i, 53, 1856.
Pipizella Rondani, Dipt. Ital. Prodr., ii, 185, 1857.
Cnemodon Egger, Verh. Zool. Bot. ges., xv, 573, 1865.
Penium Phillipi, Verh. Zool. Bot. ges., xv, 741, 1865.

Dark metallic green, or black, small or moderate-sized species, thinly pilose and finely punctulate, without yellow or light markings, except on legs and sometimes a basal band on the abdomen. Head as broad or somewhat broader than the thorax. Antennæ not longer than the head, the third joint rounded, elliptical or a little elongate, the arista basal, bare. Face flattened, receding, transversely arched, without tubercle, not, or but slightly projecting below, rounded, clothed with pile, uniformly metallic green or black. Eyes contiguous in the male, pilose. Thorax short, broad. Scutellum with an acute margin, without tubercles or spines. Abdomen about three times as long as the thorax, in its middle as broad; the segments shallowly grooved transversely. Legs not very strong, the hind femora sometimes a little thickened; hind metatarsi often somewhat thickened, always shorter than the remaining joints together. Wings rather short and broad; marginal cell open, third vein nearly straight, or gently convex, anterior cross-vein before the middle of the discal cell, first posterior cell briefly or rather long petiolate, the vein at outer part of first posterior and discal cells often bent or angulated. Type of genus, *P. noctiluca*, Linné.

TABLE OF SPECIES.

1.—	Abdomen with a basal interrupted yellow fascia	2
	Abdomen uniformly black	3
2.—	Wings with a brown spot in the middle	**festiva**
	Wings without a brown spot in the middle	**femoralis**
3.—	Third joint of antennæ at least twice as long as wide	4
	Third joint scarcely twice as long as wide, or rounded	5
4.—	Third joint of antennæ elongate; hind metatarsi much thickened; last section of fourth vein bent near its middle	**pulchella**
	Third joint elliptical, hind metatarsi but slightly thickened; last section of fourth vein bent at its antepenultimate third	**pistica**
5.—	Black pilose	**nigripilosa**
	Chiefly light pilose	6
6.—	Wings with a brownish cloud	7
	Wings without such cloud	**pisticoides**
7.—	Abdomen chiefly light pilose	**albipilosa**
	Abdomen chiefly black pilose	**puella**

For additional species, north of Mexico, see descriptions. *P. pubescens*, *P. modesta*, *P. calcarata*, *P. salax*, *P. nigribarba*, *P. fraudulenta*.

Pipiza pubescens.

Triglyphus pubescens Loew, Centur., iv, 61.

Habitat.—Wisconsin (Lw.)!

♂. Black-green, clothed with rather long dilutely lutescent pile. Hind tibiæ black pilose; the knees, base of front tibiæ, and the tarsi, except the tip and metatarsi of the front and hind pairs, yellowish. Length, 4^{mm}.

Black-green, shining, wholly clothed with rather long pile. Pile of the face white; of the front near the antennæ very dilutely lutescent; on the angle of the front above, and on the vertex, black. Antennæ black, rather long, the third joint oblong, below obscurely reddish. Pile of the thorax and scutellum lutescent. Pile of the abdomen lighter than on the thorax, near the end whitish, on the posterior margins of the second and third segments black. Legs greenish-black, pallidly pilose, the hind tibiæ black pilose above. Knees and base of front and middle tibiæ dilutely lutescent; front tarsi black, with the first joint fuscous except its base, second joint dark luteous, middle tarsi dilutely luteous, the third joint subfuscous, the last two joints black, hind tarsi black, the metatarsi moderately thickened, their tip and the two following joints dilutely luteous. Tegulæ white. Halteres light yellowish. Wings cinereous hyaline; stigma subfuscous, spurious vein nearly obsolete, except its node.

Translation, compared with the type specimen in the Cambridge Museum.

Pipiza modesta.

Triglyphus modestus Loew, Centur., iv, 62.

Habitat.—New York (Lw.)!

♀. Blackish steel-colored, clothed with short white pile; hind tibiæ white pilose; knees, base of tibiæ, and the tarsi, except the tip and the front and hind metatarsi, light lutescent. Length, 5.5^{mm}.

Blackish steely, moderately shining, clothed with short white pile; with four obscure dorsal lines. Front rather broad, shining, with a triangular white pollinose spot on each side; pile rather long, on the lower half and on the vertex white, on the upper half black. Antennæ rather long, black, third joint oblong ovate, below obscurely reddish. Dorsum of thorax and scutellum briefly white pilose. Abdomen delicately punctulate, shining, short white pilose. Legs black, the short pile white, hind tibiæ white pilose above; knees, base of hind tibiæ, and the basal half of the front and middle pairs, dilutely lutescent; first joint of the front tarsi fuscous, tip lutescent, second joint dilutely luteous, remaining joints black; first two joints of the middle tarsi dilutely lutescent, third subfuscous, last two black; first joint of hind tarsi moderately thickened, black, tip luteous, second joint dilutely luteous, third more obscure, fourth and fifth black. Tegulæ white. Halteres dilutely yellowish. Wings hyaline; stigma subfuscous.

Translation, compared with the type specimen in the Loew collection.

Pipiza calcarata.

Pipiza calcarata Loew, Centur., vi, 42.

Habitat.—New York (Lw.)!

♂. Bronze-black, white pilose, frontal triangle and the face wholly black pilose; antennæ black, below reddish. Legs black, the knees, front tibiæ, except a blackish ring, basal half of the middle tibiæ, first three joints of the front and middle, and second and third of the hind tarsi, luteous, hind coxæ with a slender process. Wings cinerescent, except the basal third. Length of body 6.5^{mm}; of wings 6^{mm}.

Bronze-black, moderately shining, white pilose. Pile of the eyes whitish, in some lights blackish or black. Pile of the frontal triangle and of the face wholly black; antennæ black, below reddish, third joint oblong; pile of abdomen very short, black, on the lateral margins and the usual metallic spots longer, white; legs black; front tibiæ, except a blackish ring, basal half and extreme tip of the middle tibiæ, first three joints of front and middle tarsi, and the second and third joints, with the tip of the first of the hind tarsi, luteous; hind coxæ armed with a slender process, dilated and compressed toward the end; hind metatarsi a little incrassate. Wings, except the basal third, cinereous, stigma subfuscous, small cross-vein from the base of the discal cell, and the last section of the fourth vein from the margin of the wing, less remote than in *P. nigribarba*, *P. femoralis*, etc.—Translation of original.

Type specimen compared. The singular long, slender process on the hind coxæ will at once render the species distinguishable.

Pipiza salax.

Pipiza salax Loew, Centur., vi, 39.

Habitat.—Pennsylvania (Lw.)!

♂. Black-bronze, white pilose; frontal triangle, anterior half of the vertical triangle and posterior margin of the eyes black pilose; antennæ black, below red; legs black, the knees, base of front tibiæ, the middle tibiæ, except a fuscous preapical ring, and the basal joints of the front tarsi, luteous. Wings, except the basal third, luteous cinereous. Length 6.5^{mm}; of wings 5.5 to 6^{mm}.

Black-bronze, moderately shining, white pilose; eyes clothed with minute black pile, below with white pile; frontal triangle, and the vertical triangle, except the posterior part, black pilose; antennæ black, below obscurely reddish; third joint oblong ovate; occiput white pilose, posterior margin of the eyes black ciliate; abdomen briefly black pilose, the first segment, the lateral margins of the remaining segments, the usual metallic spots, and the posterior part of the fourth segment white pilose; hypopygium much longer than in other species; legs black, the knees, basal third, or half of the front tibiæ, middle tibiæ, except a very broad preapical ring, first joint of the front tarsi and first two joints of the middle tarsi, luteous, second joint of the front tarsi usually reddish; hind metatarsi a little thicker than the following joints. Wings cinereous, basal third more purely hyaline, stigma subfuscous.

Type specimen compared.

Pipiza nigribarba.

Pipiza nigribarba Loew, Centur., vi, 40.

Habitat.—New York (Lw.)!

♂ Black-bronze, white pilose; frontal triangle and face black pilose; antennae black; legs black, the knees, base of front tibiae, first three joints of middle tarsi and the intermediate joints of front and hind tarsi luteous, first joint of hind tarsi strongly incrassate; wings, except the basal third, cinereous, the last section of the fourth vein angulated. Length of body 7^{mm}; of wings 6.5^{mm}.

Black-bronze, moderately shining, white pilose. Eyes thickly clothed with blackish pile; frontal triangle and the anterior half of the vertical triangle black pilose. Antennæ black; third joint oblong, on the inner side near the base obscurely red. Face black pilose, above (except the sides) white pilose. Occiput briefly white pilose, posterior margin of the eyes black ciliate; pile of abdomen black, very short; on first segment, and lateral margins of each segment, except the anterior angles and the usual metallic spots, with white and longer pile. Hypopygium short. Legs black; the extreme base of the hind tibiae, and the basal half of the front pair, luteous; front tarsi fuscous, tip of the first joint, and second joint, luteous, last two joints fuscous black; hind metatarsi strongly thickened, black, the extreme tip luteous, the two following joints luteous, last two with the tip of the preceding black; hind tibiæ clothed with rather long white pile above. Wings, except the basal third, cinerescent; stigma subfuscous, the last section of the fourth vein broken in an angle.—Translation, compared with the type specimen.

Pipiza fraudulenta.

Pipiza fraudulenta, Loew, Centur., vi, 41.

Habitat.—Illinois (Lw.)!

♂. Black-bronze, with white pile, frontal triangle and the face black pilose; antennæ black. Legs black; the knees, base of front tibiæ, first three joints of the middle tarsi and the intermediate joints of the other tarsi luteous, hind metatarsi strongly incrassate; wings, except the basal third, cinerescent, last section of the fourth vein bent, not angulated. Length of body 6.5^{mm}; of wings 6^{mm}.

Very similar to *P. nigribarba*, but the antennæ are wholly black, the hind tibiæ with long black, not white, pile above, and the last section of the fourth vein is bent, not broken into an angle.

Type specimen compared. I doubt the validity of this species.

Pipiza femoralis.

Pipiza femoralis Loew Centur., vi, 38.

?*Pipiza radicum* Riley, 1st Rep., 121, fig. 66; Amer. Ent., i, 83.

Habitat.—Illinois (Lw.) Pennsylvania!.

♂. Bronze-black, pallidly pilose, fascia of the second abdominal segment narrowly interrupted; tip of femora, the tibiæ and tarsi, luteous, the tip of the latter more obscure; wings cinereous hyaline, stigma dark ochraceous. Length 8^{mm}; of wings 7.5^{mm}.

Bronze black, moderately shining, pallidly pilose. Eyes briefly white pilose; face white pilose. Antennæ rather large, two basal joints reddish ochraceous, third black, near the base obscurely red; arista black, pallid near the base. The luteous fascia of the second abdominal segment broad and moderately arcuated, divided by a black line, and separated from the lateral margin by a black border. Pile of the abdomen short, pallid, near the base of the abdomen longer and white, between the yellow fascia and the posterior margin of the second segment, black. Femora, except the luteous tip, bronze-black; tibiæ luteous, the hind pair near the tip obsoletely annulate with fuscous; tarsi luteous, penultimate joint of the hind pairs black, of the front pair fuscous, terminal joints of the hind pair fuscous, of the front and middle pairs ochraceous or subfuscous. Wings cinereous hyaline, basal third more purely hyaline, stigma ochraceous subfuscous.

Two specimens from Pennsylvania (E. L. Keen).

Pipiza festiva. (Plate II, fig. 4.)

Pipiza festiva Meigen, Syst. Beschr., iii, 243, 2; Schiner, Fauna, etc., i, 262.
Pipiza ornata Meigen, Syst. Beschr., iii, 243, 3 (Schiner).
Pipiza lunata Meigen, Syst. Beschr., iii, 243, 4 (Schiner).
Pipiza artemis Meigen, Syst. Beschr., iii, 244, 5 (Schiner).

Habitat.—Europe!, Canada? (O. S.)

♂, ♀. Length, 6 to 10.5^{mm}. Front and face long white pilose, below the ocelli and about the base of the antennæ in the female, blackish pilose. Antennæ brown, third joint trapezoidal. Thorax white pilose. Posterior part of the second and third abdominal segments black pilose; second segment with a variable yellow band, "sometimes sulphur yellow, at other times reddish yellow; anterior margin concave or straight; sometimes interrupted by a distinct black space, at other times only by a dark line." (Schiner). Legs yellow, with black femora; tibiæ more or less brown in the middle. Wings hyaline on the basal half, externally blackish or smoky brown, fading out toward the margin; stigma dark luteous.

I give the description of this species, although it is not known for certain that it occurs in this country, it being given in Osten Sacken's catalogue, with the remark, "or a species allied to it," as occurring in Canada. The European species, *P. noctiluca*, closely related, has the tarsi in large part black.

Pipiza puella, n. sp. (Plate II, fig. 3.)

Habitat.—New Hampshire!

♂. Length, 6^{mm}. Dark bluish black, clothed with light yellowish-white pile. Frontal triangle white pilose on upper portion, black pilose below; face white pilose, except near the mouth, where it is black pilose. Antennæ black; third joint cordate. Eyes blackish pilose, in some lights showing luteous; posterior orbits wholly white ciliate, a little blackish pile at the vertex only. Abdomen with short black pile, except on the broad anterior angles and lateral margins of each segment. Legs black; the immediate tip of front and middle femora, the front tibiæ, except a broad brownish ring, the middle and hind tibiæ at base and tip, and all the tarsi, except the last two joints, yellow. Wings nearly hyaline before the cross-veins, with a distinct brownish cloud at the cross-veins, fading out beyond and behind; stigma luteous; cross-veins at outer part of first posterior and discal cells nearly parallel with the hind border of the wing, the outer posterior angle of first posterior cell with a stump of a vein.

One specimen, White Mountains, New Hampshire, August 1.

Pipiza (Penium) albipilosa, n. sp.

Habitat.—Pennsylvania!

♀. Length, 7mm. Antennae black, the third joint more brownish, and near the base, especially on the inner side, reddish; in shape obtusely pointed on the lower anterior part, subcordate, only a little longer than broad. Head and thorax shining black, with a greenish reflection, wholly clothed with nearly white, rather long pile, except just above the insertion of the antennae where there is a small quantity of black pile. Abdomen shining black, on the posterior part of the second and third segments with narrow, more dark appearing cross-bands of short black pile; pile elsewhere light colored, shorter and less abundant than on the thorax. Legs black, wholly with light colored pile; front and middle tibiæ, except a brown ring in the middle, and the hind tibiæ at base and end, and all the tarsi, except the last two or three joints (which are brown) luteous. Hind femora considerably thickened, the hind metatarsi only slightly so. Wings hyaline on the basal part, distinctly clouded with brownish across the middle, becoming less strong toward the end and posterior part; stigma yellow; outer anterior angle of the first posterior cell acute, briefly petiolate, the cross-veins at outer part of the first posterior and discal cells nearly parallel with the posterior border of the wing; posterior angle of first posterior cell obtuse, with a stump of a vein.

Two specimens from Mr. Eugene Keen, collected in Fairmount Park, Philadelphia.

Pipiza nigripilosa, n. sp.

Habitat.—Pennsylvania!

♂. Length 5.5mm. Deep shining black, with black pile. Pile on the posterior part of the vertical triangle; the post-orbital cilia and the pile of the eyes more brownish black, in some views brownish. Antennæ black, third joint brownish red, subcordate, scarcely twice as long as wide. Pile in front of dorsum of thorax in some views more brownish. Abdomen wholly with short erect black pile, except along the borders there may be a few light-colored hairs. Legs black, the tip of the femora, the front and middle tibiæ, except a brownish ring, and the base and tip of hind tibiæ, and all the tarsi, except the brownish two or three terminal joints, luteous; pile chiefly black, on the under side of the hind femora more brownish or obscurely yellowish; hind metatarsi only a little thickened. Wings hyaline, first posterior cell short petiolate, the angle acute; the cross-veins at outer part of the first posterior and discal cells nearly parallel with the hind border of the wing; stigma yellowish.

One specimen collected by Mr. Eugene Keen, in Fairmount Park, Philadelphia.

Pipiza pistica, n. sp.

Habitat.—Connecticut!

♀. Length, 7.5^{mm}. Antennae black, the third joint yellow along the lower side; in shape oblong, more than twice as long as wide. Face wholly white pilose. Front black pilose below and above, across the middle white pilose. Eyes whitish pilose, but variable in different reflections, appearing blackish. Pile on the orbits behind white. Thorax, as the head and abdomen, shining metallic black, with a light greenish reflection, moderately long, white pilose. Abdomen white pilose, except on the posterior margins of the second and third segments, where it is very briefly black pilose. Legs black, white pilose, the tip of all the femora, the rather broad base of the four front tibiæ, and the immediate base of the hind tibiæ, the tip of four front tibiæ, and the basal joints of their tarsi, yellow, the last two joints of the four front tarsi blackish; hind metatarsi very distinctly thickened. Wings hyaline, the stigma light yellow.

Two specimens, June 10, New Haven.

Pipiza pisticoides, n. sp.

Habitat.—White Mountains!

♀. Length, 6^{mm}. A single specimen taken near the base of Mount Washington, August 1, resembles *P. pistica* very much, but seems evidently different. The third joint of the antennæ is orbicular, as broad as long; the pile throughout is shorter, on the abdomen scarcely discernible; the size is also distinctly smaller.

Pipiza (Pipizella) pulchella, n. sp. (Plate II, figs. 1, 1*a*, 1*b*.)

Habitat.—Connecticut, Massachusetts!

♀. Length, 5.5^{mm}. Shining, greenish black, clothed with not very abundant nor long, nearly white pile. Front and face wholly white pilose, the former with a small triangular spot near each orbit, the latter with a narrow orbital margin, white pollinose. Post orbital cilia white; the short pile of the eyes dark. Face gently convex near the middle. Antennæ elongate, but shorter than the face; the third joint three or four times as long as wide, black, the third joint yellowish on the lower basal part. Scutellum with a slender deep groove before its margin. Abdomen very short pilose, on the posterior part of the second and third segments black, elsewhere nearly white. Legs black, white pilose; tip of all the femora, base and immediate tip of anterior tibiæ, base of hind tibiæ, first two joints of anterior, and the middle two of hind tarsi, yellow; hind metatarsi considerably thickened. Wings grayish hyaline; last section of fourth vein angulated in the middle, posterior cross-vein rectangular; stigma luteous.

Two specimens, Connecticut, Massachusetts. The convexity of the face is not so strong in one specimen as is figured.

ADDITIONAL NORTH AMERICAN SPECIES.

Pipiza divisa Walker, Trans. Ent. Soc., N. Ser., iv, 156.—Vera Cruz.

PSILOTA.

Psilota Meigen, Syst. Beschr., iii, 256, 1822.

Small, black, rather thickly pilose species. Eyes pilose, contiguous in the male. Antennæ: First two joints short, third more or less elongated, arista dorsal, basal, bare. Face pilose, the epistoma produced forwards. Abdomen short, broad. Hind femora a little thickened. Wings as in *Myiolepta;* marginal cell open; anterior cross-vein near base of discal cell; third vein nearly straight; false vein obsolete. Type of genus *P. anthracina* Meigen, Europe.

In the type of this genus the face is concave from the antennæ. In our single American species the face is convex above and concave below; the third joint of the antennæ is also more elongate. These differences are, however, not important enough to exclude our species.

Psilota buccata.

Pipiza buccata Macquart, Dipt. Exot., ii, 2, 107; pl. xviii, fig. 2.
Psilota flavidipennis Macquart, Dipt. Exot., 5e Suppl., 97; pl. v. fig. 5.

Habitat.—United States!, Carolina (Macq.).

♂, ♀. Length, 7 to 8mm. Shining, metallic greenish black. Head shining black, front and face clothed with white pile. Antennæ blackish brown, the second joint deep red or nearly black; not as long as the face. Dorsum of thorax and scutellum in the male clothed with rather abundant, erect, somewhat yellowish pile; in the female shorter, less abundant, and more whitish pile; pleuræ with whitish pile. Abdomen shining bronze black, in the male with yellowish, in the female more whitish, erect pile. Femora, except the tip, black; tibiæ and tarsi yellow, except that the middle portion of the middle and hind tibiæ is brownish or blackish, and the terminal joints of all the tarsi are blackish. Wings nearly hyaline; on the outer part, especially in front, with a brownish cast.

Two specimens in the Loew type collection at Cambridge, labeled *Psilota flavidipennis.* I have no doubt that this species is *Pipiza buccata;* that it is Macquart's *Psilota flavidipennis* is doubtful. The description of the latter is as follows:

Psilota flavidipennis.

Psilota flavidipennis Macquart, Dipt. Exot., 5e Suppl., 97; pl. v, fig. 5.

"*Nigra, flavido tomentosa, metatarso testaceo. Alis flavidis.*"

"Long. 3l. (6mm), ♂. Face à léger duvet gris, saillante dans le bas, un peu convexe dans le haut; épistome saillant. Front proéminent. Antennes noires; premier article un peu allongé, troisième oblong. Yeux velus de jaunâtre. Thorax d'un noir luisant, à poils jaunâtres. Abdomen un peu plus étroit que dans le *P. anthracina*, d'un noir mat et à poils jaunâtres; quatrième segment luisant. Pieds noirs; base des jambes et métatarse testacés. Ailes d'un jaune roussâtre assez pâle."

"Philadelphie. Cette espèce est intermédiaire entre les Psilotes et les Pipizes."

LEPROMYIA, NOM. NOV.

Lepidomyia Loew (non Bigot), Centur., v, 38, 1864.

Small, black, nearly bare species, the thorax and borders of the abdomen with sparse squamulæ. Head like that of *Chrysogaster*, but without facial or frontal wrinkles; antennæ elongate. Abdomen short, broad. Anterior cross-vein of the wings near base of discal cell, third vein nearly straight, last section of fourth vein sinuate, marginal cell open. All the femora moderately thickened and with rows of short spines below. Type of genus *L. calopus* Loew, West Indies.

Lepromyia calopus.

Lepidomyia calopus Loew, Centur., v, 38.

Habitat.—Cuba (Lw.)!

♀. Length, 5^{mm}. Black, thinly clothed with whitish tomentum. Base of the tibiæ and the first two joints of the tarsi white; wings spotted with black.

Black, rather bare, somewhat shining. Front plane, a little broader below, with a median, subobsolete impressed line, and, on each side, with two whitish pollinose spots. Antennæ narrow, about equal in length to the face; first two joints reddish, the second one a little longer than the first, and fuscous on its upper part; third joint elongate, black, the base below reddish; arista basal, bare, fuscous. Thorax with the scutellum and pleuræ thinly but evenly clothed with minute whitish squamulæ. Abdomen plane, the sides and tip with white squamulæ, wanting on the disk. Legs black, shining, somewhat bluish; base of the tibiæ and the first two joints of the tarsi white; all the femora thickened, armed below with a double series of small spines; tibiæ subclavate, the hind pair moderately arcuate. Wings hyaline, spotted with black.

Translation from the original, compared with the type specimen at Cambridge. See, also, appendix.

CHRYSOGASTER.

Chrysogaster Meigen, Illiger's Magazine, ii, 274, 1803.
Orthoneura Macquart, Hist. Nat. Dipt., i, 563, 1834.
Camptoneura Rondani, Dipt. Ital. Prodr., ii, 1857.
Cryptineura Bigot, Rev. et Magaz. de Zool., 1859.

Small, metallic green or blue, or black species, wholly without yellow markings, except on the legs, distinctly characterized from all other genera by the front in the female having transverse lateral wrinkles.

Head hemispherical, rather large, broader than the thorax. Antennæ not longer than the head, varying, sometimes the first two joints very short and the third nearly round, frequently with the third joint elongated, as also the second; arista basal, bare. Face in the sexes usually different in profile, in the male generally less concave, the epistoma less projecting, and sometimes with a distinct, more or less prominent convexity near the middle; in the female usually deeply concave and the epistoma salient. Eyes in the male contiguous (in some exotic species broadly separated). Frontal triangle sometimes swollen and with a distinct pit-like depression in the middle. Front in the female with lateral, transverse, irregular wrinkles, in the middle usually a slender longitudinal space, smooth, bounded on each side by a linear groove; over the antennæ usually with a transverse arcuate groove, below which the space is smooth. Scutellum gently thinned above near its border, sharp, sometimes wrinkled on its disk. Abdomen short, oval, flattened, the borders, however, rounded, not thinned. Legs moderately strong, simple, the hind femora scarcely longer or thicker than the others. Marginal cell of wings open, third vein straight, anterior cross-vein considerably before the middle of the discal cell, rectangular, the last section of the fourth vein frequently more or less bent, always joining the third vein considerably before its tip, often bent in so that the tip is less remote from the anterior cross-vein than is the posterior angle of the cell which it closes; the cross-vein at outer end of discal cell also joins the fourth vein considerably before its angle, the false vein frequently entirely wanting, never very distinct.

My reasons for uniting *Orthoneura* with this genus are explicitly enough given by Loew (Stett. Ent. Zeit., 1843). It is true this author and Schiner did afterwards make use of *Orthoneura*, but that the former did not have a very clear idea of the genus is sufficiently shown by his *O. nigripes*, described in the male as *Chrysogaster* and in the female as *Orthoneura ustulata*. The character these authors used was the manner of termination of the fourth vein.

TABLE OF SPECIES.

1.—Base and tip of tibiæ, or at least first two joints of tarsi, yellow or yellowish red; last section of fourth longitudinal vein rectangular; antennæ elongate . 2
Legs wholly black; last section of fourth vein curved or bent 5
2.—The last section of the fourth vein joins the third beyond the tip of second vein, rectangular, with a stump of a vein in the middle; second joint of antennæ nearly as long as the third; eyes with linear markings . . . . . **nitida**
The last section of fourth vein joins the third opposite or before the tip of the second; disk of abdomen opaque 3
3.—Eyes with linear markings . . . . **bellula**
Eyes unicolorous 4
4.—Abdomen broadly oval; wings with brownish clouds . . . . . **pictipennis**
Cross veins of wings not clouded . . . . **pulchella**

5.—Third joint of antennæ nearly rounded 7
Third joint elongate, or at least twice as long as wide; tip of fourth vein less remote from anterior cross vein than is the posterior angle of the cell included 6
6.—Third joint of antennæ elongate . . . . **stigmata**
Third joint of antennæ short . . . . **nigrovittata**
7.—Front of female lightly rugose . . . . **lata**
Front of female strongly rugose . . . . **nigripes**

Chrysogaster nigripes. (Plate II, figs. 10, 10*a*.)

Chrysogaster nigripes Loew, Centur., iv, 60 (male).
Orthoneura ustulata Loew, Centur., ix, 80 (female).
? *Chrysogaster Antitheus* Walker, List, etc., iii, 572.

Habitat.—Connecticut, New York, New Jersey, North Carolina!.

♀, ♂. Length, 7 to 8mm. Eyes unicolorous. Legs wholly greenish black. Wings a little blackish, more nearly hyaline near the base and posterior part, more or less clouded on the outer part, especially in the end of the marginal, sub-marginal, and first posterior cells; stigma dilutely brownish; the last section of the fourth vein very oblique, a little convex outward near the angle, and then more broadly concave, the tip joining the third vein in a right angle. First two joints of antennæ very short, reddish yellow; the third round or a little oval, reddish yellow, the upper border darker. Head wholly shining, except a broad white dusted cross-band on the upper part of the face just below the antennæ.

♂. Head metallic bluish green, shining; antennæ very small. Frontal triangle very large, swollen, with a longitudinal depression. Face in profile gently concave, distinctly tuberculate below the middle, the epistoma not at all prominent. Dorsum of thorax opaque black, with numerous small, greenish, more shining spots, which on the sides become confluent, forming stripes. Disk of abdomen deep opaque black, the margins shining brassy green, except at the incisures of the second and third segments, where the black may extend narrowly to the margin.

♀. Deep bluish green, the head and thorax sometimes a deep cobalt blue. Face very concave and prominent below, in profile very dissimilar to that of the male. Third joint of the antennæ much larger than in the male. Front broad and long; on the sides strongly rugose, a narrow longitudinal space in the middle smooth. Abdomen shining, but less so on the disk, the first segment, the hind margin of the second and third segments, and a rather broad, less distinct stripe, reaching nearly to the tip of the fourth segment, opaque black.

Four males and five females. In four of my specimens, both male and female, like specimens Loew described, the second and third segments of the abdomen are in large part sordid yellowish, and the wings may almost wholly lack the blackish clouds. All but one of my specimens were taken together from the same bush of *Prunus virginianus* on June 25. That they belong together I do not have the slightest doubt. Very similar differences between the sexes occur in *C. viduatur* of Europe. The neuration is precisely alike in both sexes; that Loew described them under two genera is sufficient evidence of the valuelessness of the characters upon which Orthoneura is based.

It seems very probable that Walker's *Antitheus* is this species, yet it is not at all certain, and it would be imprudent to substitute the name; nor should it be, indeed, were the type to prove this supposition correct.

Chrysogaster nigrovittata. (Plate II, figs. 11, 12.)

Orthoneura nigrovittata Loew, Zeitschr. für Naturw., 1876, 378.
Chrysogaster nigrovittatus Williston, Proc. Am. Phil. Soc., xx, 304.

Habitat.—Washington Territory, California, Colorado!.

♂, ♀. Length, 5mm. Antennæ yellowish red, the first joint and upper part of third dark or blackish; the first two joints short, the third oval. Face bluish greenish black, considerably projecting below; on the upper part with delicate transverse striæ; a narrow silvery white cross band of dust extends between the eyes immediately below the antennæ, in the middle less distinct. Frontal triangle pitted in the middle, somewhat swollen, with black pile. Eyes unicolorous, contiguous in the male for a considerable distance. Front in female rugose on the sides, narrowed above, in the middle with a slender smooth longitudinal space. Dorsum of thorax finely punctulate, deep green, with four blackish stripes, in some reflections a little coppery. Abdomen deep greenish sub-opaque, the margins shining metallic. Legs wholly black, with a greenish cast. Wings with a slightly blackish tint; stigma dark brownish; cross vein at outer part of discal cell nearly straight, the last section of the fourth vein bent inward near the middle, the anterior end joining the third before the tip of the second vein.

Six specimens from California, two from Washington Territory, and four from Colorado (H. K. Morrison).

Chrysogaster stigmata. (Plate II, fig. 8.)

Chrysogaster stigmatus Williston, Proc. Am. Phil. Soc., xx, 303.
Orthoneura sinuosa Bigot, Annales Soc. Ent. France, 1884, 556.

Habitat.—California!.

♂, ♀. Length, 6 to 7mm. Antennæ black, about as long as to the tip of epistoma, the second joint about one-third as long as the third. Face deep shining green, with delicate striæ on the upper part, smooth below, with sparse white pile, and a silvery triangle above near the orbit; gently convex, the lower part abruptly and moderately produced downwards and forwards. Frontal triangle like the face, only slightly swollen, with a distinct pit in the middle above the antennæ; vertical triangle greenish black, obtuse in front. Front in female broad, with very distinct lateral transverse furrows. Dorsum of thorax deep shining green, with short whitish pubescence. Scutellum distinctly grooved before its tip. Abdomen flat, broadly oval, with delicate white pubescence; the dorsum black with a greenish cast, the sides broadly, and the hypopygium, brassy, much shining; in the single female specimen the brassy color is confined to the sides of the first two segments and the anterior angles of the third. Legs shining greenish black. Wings with a distinct blackish tinge, stigma brown, outer posterior angle of first posterior cell rounded or obtusely angulated, usually with a stump of a vein, the tip of fourth vein strongly bent inward.

Four specimens.

Chrysogaster pulchella, n. sp. (Plate II, fig. 9.)

Habitat.—New Hampshire, Connecticut, Canada!

♂, ♀. Length, 4½ to 5mm. Antennæ yellowish or brownish red, the third joint black, except at the base; second joint less than half the length of the third, the whole antenna about as long as the face. Head deep metallic greenish black; face with delicate striæ on the upper half, and a small triangular, silvery spot near the eye on each side above, epistoma considerably protuberant; in the male the face is more nearly straight in profile with a short, rather deep concavity on the lower part. Frontal triangle not rugose, a little swollen and pitted; front in female narrowed above, strongly rugose on the sides, in the middle with a slender, longitudinal space, and the lower part, smooth. Eyes unicolorous. Dorsum of thorax strongly metallic, but little shining, greenish brassy, delicately roughened, with four coppery, in some reflections purplish, stripes. Pleuræ brilliant. Abdomen not very broadly oval, opaque black on the disk, brilliant metallic on the margins and venter. Legs metallic black; extreme tip of femora, base and tip of tibiæ, and first two joints of the tarsi, reddish yellow. Wings nearly hyaline, faintly clouded on outer part, stigma brown, last section of fourth vein nearly straight, a little oblique, so that the anterior angle of the cell is slightly obtuse.

Sixteen specimens from the White Mountains, N. H. (July 25–30), two additional ones from the same regions from Dr. George Dimmock (1561–2), and two others from Connecticut, June 20. The third joint of the antennæ may be in large part yellowish red, the black confined to the upper border and distal part. The last section of the fourth vein is usually quite straight, but sometimes slightly sinuate, and in one specimen with a stump of a vein near the middle on the inner side.

Chrysogaster nitida. (Plate II, figs. 7, 7*a*.)

Chrysogaster nitidus Wiedemann, Auss. Zwei. Ins., ii, 116, 1.
Cryptineura hieroglyphica Bigot, Rev. et Magaz. de Zool., 1859.
Paragus aeneus Walker, List, etc., iii, 545.
Orthoneura hieroglyphica Loew, Centur., iv, 58, note.
Orthoneura nitida Schiner, Novara Exped. Dipt., 368, 99; Osten Sacken, Cat. Dipt., 121.

Habitat.—New England, Pennsylvania, Virginia, South Carolina, Kansas!, South America (Schiner).

♂, ♀. Length, 4 to 5mm. Head brassy metallic black. Antennae longer than the face, first and second joints yellowish red or brownish, the third black, only a little longer than the second. Face rugose; concave on the lower part, the epistoma but slightly produced; a small silvery spot on each side near the eye above. Front in female narrow above, strongly transversely rugose, with a median furrowed longitudinal line. Frontal triangle rugose. Eyes with a median straight horizontal line and two vertical labyrinthine brown lines. Dorsum of thorax metallic green, finely roughened, with four longitudinal stripes of a coppery or metallic purple color, in some reflections brown, the outer ones more or less divided into two nearly contiguous ones. Scutellum more distinctly roughened, or lightly rugose, grooved before the apex. Abdomen deep metallic green, roughened, and only a little shining on the disk, but distinctly so on the margin and tip. Second and third segments with more or less distinct cross-bands of a more opaque color in front and behind. Legs metallic black; knees and base of tibiæ and their tip, and first two joints of tarsi, reddish yellow. Wings nearly hyaline, with slender blackish spots on the outer cells; stigma dilutely brownish; a narrow brown cloud from tip of second vein reaching across the submarginal cell; cross veins narrowly clouded with brown; veins at outer part of discal and first posterior cells rectangular, nearly straight, slightly angulated in the middle, and with a stump of a vein on the inner sides; the fourth vein terminates distinctly beyond the tip of the second.

Numerous specimens.

Chrysogaster bellula. (Plate II, figs. 6, 6*a*.)

Chrysogaster bellulus Williston, Trans. Amer. Phil. Soc., xx, 304.

Habitat.—California, Washington Territory, Colorado!.

♂, ♀. Length, 4.5 to 6^{mm}. Antennæ reddish or reddish brown, about as long as the face, second joint shorter than the third. Face deep green, lightly rugose, white pilose, a small triangular white silvery spot near each orbit just below the antennæ; epistoma moderately produced downwards. Frontal triangle not swollen, rugose; front (♀) with well marked lateral rugosities; eyes with irregular narrow brown markings. Thorax and scutellum bright green, scabrous, with four coppery stripes. Abdomen oval, a little darker green, sometimes with a bluish cast, opaque, shining on the borders, lightly punctulate, on the posterior part of each segment sometimes coppery. Legs blackish green, base and tip of the tibiæ usually narrowly, and the basal joints of the tarsi, yellowish red. Wings nearly hyaline, lightly clouded in the outer cells, stigma brownish, the cross-veins scarcely clouded; last section of the fourth vein usually straight, rectangular, joining the third nearly opposite the tip of the second vein, clouded with brown, the cloud either extending across to the tip of the second vein or more or less interrupted in front of the third.

Twelve specimens, Colorado (Professor Comstock), California, Washington Territory.

Differs from *C. nitida*, which it closely resembles, in the second joint of the antennæ being shorter, the concavity of the face less, and in the termination of the fourth longitudinal vein.

Chrysogaster pictipennis.

Orthoneura pictipennis Loew, Centur., iv, 58.

Habitat.—Connecticut, New York, New Jersey!.

♂, ♀. Length, 5.5 to 6^{mm}. Head metallic bronze-green. Antennæ elongate, black, the first two joints and the base of the third reddish; considerably longer than the face, the third joint not three times as long as the second. Face finely wrinkled in both sexes; the epistoma considerably and abruptly projecting; on each side of the base of the antennæ near the eye a triangular silvery white spot. Front in female broad, markedly rugose, with a slender median furrow. Eyes unicolorous. Dorsum of the thorax moderately shining, finely punctulate, with four bronze-purple stripes, the lateral ones abbreviated in front, the intermediate ones behind. Scutellum flattened. Disk of the abdomen moderately shining, the margins bronze-green or coppery shining. Legs green-black, the base and tip of the tibiæ and the first two joints of the tarsi reddish yellow. Tegulæ white. Halteres dilutely yellowish. Wings cinereous; the discal and first posterior cells with brownish spots, stigma and clouds on the transverse veins fuscous; the fourth vein terminates in the third before the tip of the second, the terminal segment, and the vein at outer end of discal cell, straight, with a stump of a vein on the inner side.

Six specimens.

Chrysogaster lata.

Chrysogaster latus Loew, Centur., iv, 59.

Habitat.—British North America (Loew), Oregon!.

♀. Bronze-black, shining, legs wholly of the same color, antennæ of moderate size, black, third joint rotund, piceous; sides of the front below transversely rugose; wings sublutescent, stigma and veins luteous. Length, 7^{mm}.

Bronze-black, shining, with sparse, very short whitish pile. Front broad, on the sides below transversely rugose. Antennæ of moderate size; third joint subrotund, fuscous, arista of the same color. Facial tubercle wanting, epistoma strongly produced. Abdomen broad, shining, the posterior margin of the last segment entire. Legs wholly bronze-black. Halteres and tegulæ lutescent. Wings toward the costa dilutely sublutescent, veins and stigma luteous. (English River, Kennicot).—Translation.

A single female specimen from Mount Hood, Oreg., agrees very well with this description. The front is only lightly rugose on the sides.

P. S.—An examination of the type at Cambridge assures me that the Oregon specimen belongs here.

CHILOSIA.

Cheilosia Meigen, System. Beschr., iii, 296, 1822.
Cartosyrphus Bigot, Annal. Soc. Ent. de France, 1883, 230.

Moderately large to rather small species, metallic black, or black-green, rather thickly pilose, sometimes almost quite bare. Head hemispherical, scarcely broader than the thorax. Antennæ short, small, third joint rounded or a little oval, never elongate, with a basal, bare, pubescent, or plumose arista. Face black or metallic green, rarely somewhat reddish below, thinly pilose or pollinose, or quite bare; a little below the middle with a tubercle, usually thence more sharply concave to the slightly projecting oral margin; near the eye, with a more or less distinct, parallel, slender groove; in profile the lower part sometimes produced downwards and forwards, at other times nearly perpendicular. Eyes pilose or bare, contiguous in the male. Front in female never wrinkled, usually with one or more linear depressions; in the male the frontal triangle more or less swollen, with an impressed longitudinal line or pit. Scutellum rarely reddish on the border, sometimes along its margin with a row of bristly hairs. Abdomen longer than the thorax, elongate oval, never slender; of five or six segments. Legs simple, rather weak. Marginal cell of wing open, third vein gently convex anteriorly, anterior cross vein towards the base of discal cell; outer anterior angle of first posterior cell always acute.

In Europe this genus comprises nearly a hundred species, and it is not probable that more than one-third of our species are known. The flies are inconspicuous and not very active. The sexes differ much, in not a few cases, in the color and length of the pile, in the color and size of the third antennal joint, and in the markings of the abdomen, which in the male is sometimes velvety opaque on the disk; moreover, in the female the face below, the humeri, and border of the scutellum, are sometimes reddish or yellowish.

TABLE OF SPECIES.

1.—Eyes pilose 2
Eyes bare 6
2.—Wings yellowish at base; pile on dorsum of thorax light colored 4
Wings not lighter at the base; the veins blackish; pile of dorsum black . 3
3.—Antennæ black; eyes densely pilose; face but slightly concave in profile below the antennæ (♂) . . . . **occidentalis**
Antennæ yellow; eyes thinly pilose; face considerably concave below the antennæ (♂) (See Appendix.) . . . . **hoodiensis**
4.—The face extends considerably below the eyes; the distance from antennæ to tip of tubercle much greater than thence to lowest part; above the tubercle in profile gently concave . . . . **lasiophthalma**
Face not much produced downward; in profile considerably concave below the antennæ 5

5.—Antennæ brown; third joint small, subquadrate; arista bare; facial tubercle not projecting beyond antennal process; long pilose . . . . **Baroni**

Antennæ light reddish-yellow; third joint rather large, oval; arista finely pubescent; facial tubercle strongly projecting; pile of body short. **petulca** ♀

6.—Scutellum with bristles on its margin 7

Scutellum without bristles on its margin 11

7.—Second and third segments of abdomen chiefly opaque black; arista pubescent (? *leucoparea* ♂) . . . . **pallipes** ♂
tristis ♂

Abdomen, or at least third segment, wholly shining 8

8.—Arista pubescent; humeri, scutellum, and lower part of the face with more or less reddish or yellowish; abdomen wholly shining 9

Arista pilose; body without light markings 10

9.—Pubescence of the arista short; face pallid below on the sides; legs luteous, femora except the tip, black . . . . **leucoparea**

Pubescence of the arista rather long; face with a yellowish spot on each side below . . . . **pallipes** ♀
tristis ♀

10.—Legs black . . . . **lugubris**

Legs in large part yellowish; color blackish steely blue, wholly shining in the female, in the male a sub-interrupted posterior opaque cross-band on the second abdominal segment . . . . **cyanescens**

11.—Second and third segments, at least, of the abdomen in the male chiefly opaque black 12

Abdomen wholly shining 14

12.—Legs black; pile of thorax black 13

Tibiæ and tarsi in large part yellowish; pile of thorax lutescent . **capillata** ♂

13.—Fourth segment of abdomen opaque, except the anterior angles; veins of wings black . . . . **nigripennis**

Fourth segment shining, except a median stripe; veins of wings in large part yellowish . . . . **versipellis**

14.—Facial tubercle very obtuse, not produced beyond a line from base of antennæ to the tip of epistoma; the concavities long and shallow . **versipellis** ♀

Facial tubercle projecting, rounded 15

15.—Femora almost entirely luteous . . . . **parva**

Femora black 16

16.—Veins of wings luteous (? *capillata* ♀) . . . . **comosa**

Veins of wings black (? *nigripennis* ♀).

(See, also, Appendix.)

Chilosia petulca, n. sp. (Plate II, fig. 15.)

Habitat.—Washington Territory!

♀. Length, 9mm. Shining greenish black, the head shining black. Face with a band of white pollen below the antennæ, extending downwards narrowly along the eyes; rather deeply concave below the antennæ, the tubercle much more prominent than the antennal process, shortly and deeply concave between it and the oral margin, not much produced downwards; the lower border of the cheeks gently concave. Antennæ light reddish yellow, the third joint large, oval; the arista black, finely but distinctly pubescent. Front with whitish dust near the middle on the sides, pile short. Eyes pilose. Dorsum of thorax with short whitish pile; on the post-alar callosities, and border of scutellum, with fine black bristles. Abdomen shining dark metallic green, pile light colored, very short and thin. Legs brownish black; tip of femora, base and tip of four front tibiæ, yellow; base and tip of hind femora, and the four front tarsi, yellowish brown. Wings lightly infuscate; stigma light yellow, veins near the base yellowish.

One specimen. This species differs from *C. Baroni*, to which it is most nearly allied, in the antennæ being larger and lighter colored, the arista pubescent, the facial tubercle smaller and much less projecting. The pile of the front, thorax and abdomen is, moreover, much shorter.

Chilosia Baroni, n. sp.

Habitat.—California, Washington Territory!

♂, ♀. Length, 7 to 9mm. Deep shining black, with moderately abundant whitish pile. Eyes pilose. Face on the sides somewhat whitish pollinose, but without pile, except laterally between the lateral groove and the eye; near the middle a very large and convex tubercle; not extending downward much below the eyes; cheeks not broad. Antennæ small, reddish brown, third joint nearly square; arista bare. Frontal triangle somewhat swollen, with an impressed longitudinal line; pile fuscous. Front shining, clothed with abundant whitish pile. Thorax, on the post-alar callosities and the border of the scutellum, with black bristly hairs; the pile rather abundant and long. Abdomen everywhere shining, more metallic on the sides; the pile rather long and abundant on the sides toward the base. Legs black; tip of femora, and tibiæ, except a black ring, yellowish red, the hind tibiæ sometimes with only the base and the tip reddish; basal joints of the middle tarsi, and sometimes of the hind tarsi, yellowish red, the terminal joints blackish. Wings nearly hyaline, in the region of the cross-veins yellowish, faintly blackish toward the outer part; veins at the base, except the costa, yellowish.

One male and three female specimens, Washington Territory and California (O. T. Baron). The specimen from Washington Territory is larger, and the third joint of the antennæ is reddish yellow.

Chilosia lasiophthalma. (Plate III, fig. 2.)

Cheilosia lasiophthalmus Williston, Proc. Am. Phil. Soc., xx, 306, 1882.

Habitat.—Colorado!

♂. Length, 10 to 11mm. Frontal triangle moderately swollen, with an impressed longitudinal line, and light yellowish pile. Antennæ brownish red, third joint not large, nearly square; arista bare, black. Face deep shining black, with yellowish pubescence, nearly vertical below the antennal prominence, tuberculate below; considerably produced below the eyes; a well-marked groove begins at the base of the antennæ, runs obliquely outward, to the eye, then curves downward near the eye into the cheek. Posterior orbits below broadly dusted with yellow. Eyes thickly reddish yellow pilose. Thorax deep metallic green, shining, thickly covered with yellow or reddish yellow pile, on the pleuræ bushy. Abdomen rather broadly oval, shining black, with abundant pile like that of the thorax. Tegulæ light yellow. Legs black, with yellow pile; femora at the tip, base and tip of tibiæ, and basal joints of middle tarsi, yellow or luteous; front and hind tarsi brownish with more or less yellowish. Wings subhyaline with an indistinct brownish spot near the middle; veins of the basal part yellowish.

Thirteen specimens, Colorado.

Chilosia occidentalis. (Plate III, figs. 1, 1*a*.)

Cheilosia occidentalis Williston, Proc. Am. Phil. Soc., xx, 305.

Habitat.—California!

♂. Length, 11^{mm}. Eyes thickly pilose; frontal triangle black, with black pile, somewhat swollen and with a central depression. Antennæ black, third joint somewhat brownish, nearly orbicular, small; arista with scarcely perceptible pubescence. Face shining black; on the sides with rather long, sparse, light-colored pile; slightly concave from base of antennæ to tip of tubercle, shortly and deeply concave below the latter; a well-marked groove on the side parallel to the eye, running obliquely to the base of the antennæ. Thorax deep green-black, with blackish pile mixed with shorter lutescent. Scutellum on its border with a row of longer hairs. Abdomen oval, not at all slender, shining metallic green on the sides and fourth segment; the first three segments mostly opaque black; pile reddish yellow, rather long and abundant on the sides of the segments, nearly bare in the middle. Legs black, with yellowish and black pile; tibiæ reddish at base and tip. Wings with a slight blackish tint, the veins black.

One specimen, California.

Chilosia pallipes. (Plate III, fig. 5.)

Chilosia pallipes Loew, Centur., iv, 70.
? *Chilosia tristis* Loew, ibid., 71.

Habitat.—White Mountains, Washington Territory, Oregon!, California, District of Columbia (O. S.).

♀. Length, 7 to 8^{mm}. Shining metallic obscurely green. Front moderately broad, shining, lightly pollinose on the sides below, with a slight concavity in the middle above the base of the antennæ; pile yellow. Antennæ ferruginous red, third joint rather small, rounded-ovate; arista black, rather thickly and long pubescent. Face whitish pollinose across below base of the antennæ; shining black, except on each side below, there is a yellowish spot, sometimes smaller, at other times large and extending from the eye to the oral margin. In profile the face is deeply concave below the antennæ, and the tubercle large and obtuse. Eyes bare. Humeri light yellow; pile of thoracic dorsum very short, yellow. Scutellum at the tip, or most usually nearly wholly, brownish yellow, the base black; pile yellow, and with six black bristles on its border. Abdomen wholly shining, not very oval; pile very short, on the disk obscure, on the sides longer, whitish. Legs yellow; hind femora, except basal third and tip, a ring on the outer part of hind tibiæ, and the hind tarsi, brown or blackish; sometimes the black is of greater extent on the hind legs, and there may be brownish rings on the outer part of middle femora and tibiæ. Wings hyaline.

♂. Face wholly shining black, except the thin whitish pollen below the antennæ and on the sides below the tubercle. Frontal triangle small, slightly swollen, lightly fossulate, pile black. Thorax and scutellum wholly shining black, with only a slight bronze or coppery reflection; pile black, rather long, especially in front; behind, intermixed with reddish yellow. Scutellum wholly shining black, pile long, black, with reddish yellow, the latter more conspicuous as a fringe on the under side of the margin. Abdomen opaque black; the first segment, large spots on the anterior angles of the third, the fourth segment wholly, and likewise the hypopygium, shining, metallic greenish black; pile on the disk black; on the sides toward the front, longer, yellow. Legs black, tip of all the femora, base and tip of the tibiæ, and the extreme base and tip of all the tarsal joints, yellowish red. Wings distinctly yellowish or brownish in front toward the base.

Five males and forty females taken together (Jackson, N. H., July 25–30,) assure me that they must belong together. The females agree precisely with the description of *pallipes*, except that they are all larger, while the males agree equally well with *tristis*, the female of which Loew describes; and the only differences which it shows from the above are that the legs are black, except the knees and base of the tibiæ, and the light-colored humeri are not mentioned. In some of my female specimens, however, the front and middle legs are in large part blackish, and in one they are almost wholly black. Two male specimens from Washington Territory and Oregon I refer to this, although the pile of the dorsum of the thorax is wholly black, and the legs are less black, the front and middle tibiæ having only a black ring, and the first two joints of the tarsi yellowish. They are also distinctly larger.

Chilosia cyanescens. (Plate III, figs. 3, 4.)

Chilosia cyanescens Loew, Centur., iv, 67 (male).
? *Chilosia plumata* Loew, ibid., 68 (female).

Habitat.—Connecticut, New Hampshire!, Illinois (Loew).

♂. Length, 5 to 6^{mm}; of wings, 6 to 7^{mm}. Blackish blue, shining; pile of the front and thorax black, of the abdomen light colored. Antennæ small, yellowish red, third joint ovate; arista black, plumose. Face wholly black; except on the moderately projecting tubercle, lightly pollinose. Eyes bare. Frontal triangle small. Margin of the scutellum with black bristles; on the under side with whitish pile. Abdomen wholly shining. Femora black, at the tip reddish yellow; anterior and middle tibiæ reddish yellow, with a black ring; hind tibiæ black, the base somewhat broadly, the tip narrowly, reddish yellow; the first two pairs of tarsi yellow, their last joint black, hind tarsi black, the third and fourth joints yellowish. Tegulæ white; halteres yellowish, their heads above black. Wings rather long, dilutely yellowish or subfuscous, more yellowish toward the base, veins at the base yellowish, on the outer part darker; stigma but little darker.

This description is that of Loew for *C. cyanescens*, which applies closely throughout to specimens from Connecticut and New Hampshire, with the important difference that there is, in mine at least, a moderately broad, opaque, black cross-band on the second abdominal segment. I can hardly think that Loew would have overlooked this character, but yet, until specimens are obtained without this band, and differing otherwise specifically, I prefer to consider my specimens as belonging to this species. With my White Mountain specimens I obtained several females, which evidently belong to the same species. Their description is as follows:

♀. Blackish blue, shining; pile everywhere short, on the thorax and scutellum black, on the abdomen white. Front narrow, plane, gently fossulate above the base of the antennæ. Antennæ reddish yellow, third joint large, oval; arista black, plumose. Face black, lightly pollinose, the moderately projecting tubercle, together with the oral margin in front, luteous. Sides of the thoracic dorsum and the margin of the scutellum, with black bristles. Abdomen wholly shining. Front and middle legs luteous, last joint of all the tarsi black, the middle femora and tibiæ subfuscous near the middle; hind legs black, the base and tip of both femora and tibiæ luteous, the third and fourth joints of the hind tarsi fuscous-luteous. Tegulæ white; halteres wholly light yellow. Wings yellowish, the veins fuscous toward the outer part, stigma dilutely lutescent.

This description, it will be seen, is almost precisely like that of *C. plumata*, as given by Loew, except that he describes the antennæ as moderate in size, whereas in my specimens they are unusually large for a *Chilosia*.

Chilosia capillata.

Chilosia capillata Loew, Centur., iv, 65.
Cartosyrphus lamprurus Bigot, Annales Soc. Ent. Fr., 1884, 552.

Habitat.—District of Columbia (Lw.), Virginia!

♂. Length, 7^{mm}. Shining metallic green. Eyes bare. Antennæ yellowish red, first joint and outer end of third black; arista bare (pubescent only under a strong lens), black. Face shining black, in profile with a long concavity, the tubercle nose-like, projecting considerably forwards; on the sides above pollinose, extending across as a band below the antennæ. Frontal triangle a little swollen, gently pitted, with long yellowish pile. Dorsum of thorax, pleuræ, and scutellum clothed with rather long yellowish pile. Scutellum without bristles on its border, transversely grooved before the margin above. Abdomen shining metallic green, the second and third segments, except the broad anterior angles, opaque, or subopaque, black; pile light yellowish, or whitish in front. Legs yellowish red; all the femora, except the tip, and the last two joints of all the tarsi, black; hind metatarsi, and the hind tibiæ in the middle, fuscous. Tegulæ yellowish white; halteres reddish yellow. Wings cinereous hyaline; veins reddish yellow, on the outer part and behind black; stigma yellow.

Six specimens, Virginia (Mr. Theo. Pergande).

Chilosia comosa.

Chilosia comosa Loew, Centur., iv, 66.

Habitat.—Colorado!, English River, Winnepeg (Lw.).

♂. Length, 6mm. Shining metallic green, with rather long yellowish pile. Frontal triangle large, with blackish pile. Face shining black, lightly pollinose on the sides and above. Antennæ rather small, first joint black, second and third joints obscurely red; arista black, bare. Eyes bare. Scutellum without black bristles. Abdomen wholly shining, but less so on the anterior segments. Legs black; tip of femora, base and tip of tibiæ, yellowish red. Wings cinereous hyaline, stigma and veins yellowish, the latter on the outer part and the costa darker.

♀. The pile shorter, the third antennal joint larger and lighter-colored, the tibiæ in larger part, and the tarsi in part, yellowish red.

Two males and one female from Colorado.

Chilosia nigripennis. (Plate II, fig. 14.)

Cheilosia nigripennis Williston, Proc. Am. Phil. Soc. xx, 307.
Cartosyrphus infumatus Bigot, Annales Soc. Ent. France, 1884, 553.

Habitat.—Mount Hood, Oregon!.

♂. Length, 6 to 7 mm. Deep black. Eyes bare. Frontal triangle and face shining black, the former a little fossulate, the latter very slightly excavated below the antennæ, below the tubercle shortly and deeply concave; sparsely blackish pilose. Antennæ small, basal joints black, third joint reddish brown or brown, rounded; arista bare. Thorax black, nearly opaque, with short black pile above, longer on the scutellum and pleuræ; scutellum shining, without bristles. Abdomen short, broadly oval, depressed; opaque velvety black, with a bluish cast; pile on the sides of the anterior segments reddish yellow; anterior angles of the third and fourth segments shining metallic; hypopygium shining. Tegulæ with a blackish border, and a fringe of black pile. Legs wholly black. Wings blackish in front, clearer behind; veins black.

Three specimens from Mount Hood, Oregon.

Chilosia versipellis, n. sp.

Habitat.—Washington Territory!.

♂. Length, 5½ mm. Antennæ small, first two joints black, third subquadrate, reddish yellow; arista bare. Frontal triangle much swollen, fossulate, pile black. Face shining black, with short, sparse pile, gently concave below the antennæ, in the middle forming a very obtuse angular tubercle, thence gently concave. Eyes bare. Thorax black, nearly opaque, with black pile of moderate length. Tegulæ light yellow, with a fringe of light yellow pile; halteres yellow. Abdomen deep velvety black; the small anterior angles of the third segment, and the fourth segment, except a median stripe dilated in front and not reaching the hind border, shining black. Legs wholly black. Wings with a yellowish tinge; veins yellowish, blackish on the outer part.

One specimen.

Chilosia parva. (Plate II, fig. 13.)

Cheilosia parva Williston, Proc. Am. Phil. Soc., xx, 307, 1882.
Melanogaster ochripes Bigot, Annales Soc. Ent. Fr., 1884, 555.

Habitat.—Oregon!.

♀. Length, 5^{mm}. Shining metallic green, with a brassy reflection. Eyes bare. Front with short blackish pile. Face slightly excavated below the antennæ, the tubercle large, obtuse, the epistoma much less protuberant. Thorax with short, sparse, lutescent pile. Abdomen broadly oval; wholly shining, nearly bare, whitish pubescent toward the end. Legs reddish yellow; the tibiæ with a small brownish ring, and the terminal joints of the tarsi brown; sometimes the anterior femora at the base, the hind femora in large part, and larger rings of the tibiæ, brown or blackish. Wings brownish; stigma luteous; veins black, yellowish at base.

Four specimens.

Chilosia lugubris, n. sp.

Habitat.—California!.

♂. Length, 8 to 10^{mm}. Deep black, moderately shining. Antennæ small, black, the third joint reddish brown, nearly rectangular above, rounded below; arista black, plumose. Face shining, lightly pollinose, gently concave on upper part. Frontal triangle large, black pilose. Thorax with considerable black pile; on the margin of the scutellum with fine bristly hairs. Abdomen wholly shining, with light-colored pile. Legs black, the knees very narrowly yellowish. Wings with a blackish tint; before the humeral cross-vein quite dark, veins black, stigma yellowish.

Two specimens. The posterior part of the second and third abdominal segments are less metallic or sub-opaque. The eyes are bare. The pile of the thorax, when seen from behind, seems mostly black, from in front, luteous.

Chilosia leucoparea.

Chilosia leucoparea Loew, Centur., iv, 69.

Habitat.—Carolina (Lw.).

♀. Length, 6.5^{mm}. Black; eyes bare, antennæ red, arista very briefly pubescent; face below on each side light colored; humeri light colored; margin of the scutellum testaceous, provided with bristles; legs luteous, femora, except the tip, black. Black, moderately shining; pile short and not abundant, on the disk of the abdomen and at the tip blackish, elsewhere whitish; pile of the vertex a little longer, black. Front narrow, plane. Antennæ wholly red, third joint rounded oval; arista black. Face black, shining, above strongly excavated, below pallid on each side; tubercle rather large, obtuse. Dorsum of thorax and scutellum roughened; abdomen very lightly punctulate, shining. Legs lutescent; femora, except the tip, black; hind tibiæ and metatarsi subfuscous, lutescent at base and tip. Halteres whitish; tegulæ white. Wings subhyaline, lightly cinereous sublutescent, base clearer, stigma more saturate lutescent.—Translation.

ADDITIONAL NORTH AMERICAN SPECIES.

Chilosia frontosa Bigot, Ann. Soc. Ent. de Fr., 1884, 553 (*Cartosyrphus*).—**Mexico.**

MELANOSTOMA.

Melanostoma Schiner, Wien. Entom. Monatschr., iv, 213, 1860.

Medium size, exceptionally large, species, thinly pilose or nearly bare, metallic black or black green; the abdomen with lighter-colored spots or bands, usually slender. Head hemispherical. Antennæ short; third joint oval or a little elongate; arista basal, bare. Face distinctly tuberculate, nearly bare, always black or black-green, never in ground color yellow, though frequently with whitish dust. Eyes bare, contiguous in the male. Thorax shining, never with yellow or reddish markings. Abdomen elongate, slender, rarely much oval, considerably flattened. Legs simple, the hind metatarsi sometimes a little thickened. Wings rather large, extending beyond the abdomen; marginal cell open; third vein nearly straight; outer anterior angle of first posterior cell acute.

TABLE OF SPECIES.

1.—Legs red, not very slender, the hind metatarsi a little thickened; third abdominal segment scarcely at all narrowed behind; second, third, and fourth segments with metallic cross-bands, the last not interrupted; wings only a little longer than the abdomen . . . . **rufipes.**

Legs more or less black; or, if without black, slender, and the hind metatarsi not at all thickened 2

2.—Legs quite slender, the metatarsi of the male not thickened, abdomen in the male with three pairs of reddish-yellow spots 3

Hind metatarsi of the male always somewhat thickened; bands of abdomen metallic or greenish, not reddish-yellow 4

3.—Face with a prominent tubercle; abdomen of male narrow, elongate, broadest at tip of fourth segment, spots elongate . . . . **angustatum.**

Tubercle of face not at all prominent, indistinct; abdomen not elongate, not broadest at tip of fourth segment, spots quadrate; in female oval with four pairs of triangular spots . . . . **mellinum.**

4.—The pollen of the face leaves small circular confluent spots, ripple-like, of the ground color; second abdominal segment distinctly broader behind, . **tigrinum.**

The pollen of the face is uniform, or if somewhat ripple-like, not composed of circular spots 5

5.—Pollen of face somewhat striate on the sides; pile of thorax dusky . **obscurum.**

Pollen of face uniform; pile of thorax whitish 6

6.—Abdomen slender . . . . **coerulescens.**

Abdomen oval (*Syrphus simplex*).

For additional species, see descriptions.

Melanostoma (?) rufipes.

Cheilosia rufipes Williston, Proc. Am. Phil. Soc., xx, 306. 1882.

Habitat.—Washington Territory!

♀. Length, 8 to 9 mm. Face shining black, except the prominent tubercle and the cheeks, partially concealed beneath even, whitish pollen. Front a little narrowed above; below the middle a shallow, transverse depression, on each side of which there is a triangular whitish pollinose spot near the eye, continuous along the eye narrowly to the face. Antennæ blackish, third joint a little elongate, reddish on the under side. Thorax metallic green-black, finely punctulate, nearly bare, the pubescence whitish. Abdomen elongate oval, the third segment of nearly equal width throughout, not narrowed behind; first segment shining; second segment on the sides with a large triangular spot, extending the whole length of the segment on the sides, light green, moderately shining, elsewhere sub-opaque black, with a slight greenish reflection; third segment similar, but the spots more narrowly separated; on the fourth segment the spots are confluent, forming an entire cross-band, concave behind, the remainder of the segment shining black; remaining segments wholly shining greenish. Legs dark red, rather stout; the hind femora, or all the femora, more or less brown or blackish at the base; hind metatarsi a little thickened. Wings short, projecting but little beyond tip of abdomen, nearly hyaline; stigma dilutely yellowish.

Four specimens, Washington Territory.

Until the male of this species is known, its position is somewhat doubtful. Its relationship to Chilosia is very strong, but the distinctly-banded abdomen would seem to remove it from that genus; possibly it is a Platychirus. With these four specimens is a fifth, agreeing throughout in every respect with the others, except that the femora are a little darker, and the abdomen, except the first segment, is of a uniform deep red. The color seems not to be due to immaturity.

Melanostoma tigrinum. (Plate III, fig. 8.)

Melanostoma tigrina Osten Sacken, West. Dipt., 323.

Habitat.—Washington Territory, California, Colorado, Arizona!

♂. Length, 6 to 9 mm. Face and front dark metallic green, the former with white pollen, forming transverse, irregular dotted ripples, the intervals of which show the ground color; the cheeks and a stripe running over the facial tubercle are bare of pollen; facial tubercle obtusely projecting. Antennæ black, third joint and arista brown, or reddish. Front faintly and evenly grayish pollinose and with erect black pile; vertical triangle metallic green, with black pile. Thorax metallic bluish green, clothed with dull grayish pile, more whitish on the pleuræ. Halteres brownish. Abdomen elongate-elliptical, broadest at the hind margin of the second segment; first segment greenish black; the second velvet-black opaque, the lateral edges metallic olive green with a small subtriangular expansion; third segment anteriorly with an interrupted metallic greenish cross-band, nearly half as broad as the segment, but expanded on the sides along the whole lateral margin; the posterior half of the segment is of a velvet-black, which does not quite reach the lateral margin; the fourth segment is like the third except that the olive green cross-band is not interrupted, or only sub-interrupted, and connected by a longitudinal stripe of the same color, cutting through the velvet-black portion, with the narrow hind margin of the segment; thus the velvet-black on this segment forms a broad, interrupted cross-band, narrowly reaching the lateral margin; fifth segment and hypopygium metallic green. Femora metallic green; knees yellowish brown; tibiæ yellowish brown or brownish yellow at the base, darker toward the tip, especially of the last pair; tarsi black, first joint of the middle tarsi brown; first joint of the hind tarsi incrassate. Wings subhyaline; stigma brownish yellow.

Six specimens from the Pacific regions, four from Colorado, and three from Arizona, I have examined, and it is a little singular that only males are yet known.

Melanostoma obscurum.

Syrphus obscurus Say, Amer. Ent., i, pl. xi; Compl. Wr. i, 23; Wiedemann, Auss. Zw. Ins. ii, 131 (translation from Say).

Melanostoma obscura Osten Sacken, Cat. Dipt., 121.

Habitat.—Atlantic States!

♂, ♀. Length, 6 to 8^{mm}. Head metallic greenish black, shining; face, except the tubercles and cheeks, thinly covered with grayish pollen, on the sides forming indistinct ripples, through which the ground color shows more plainly; tubercle not prominent, not jutting so far forwards as the epistoma. Antennæ black, third joint brown, more or less reddish below, or even wholly reddish. Frontal and vertical triangles more shining, with black pile. Thorax shining greenish black, pile blackish on dorsum, on the scutellum intermixed with yellowish, on the pleuræ wholly yellowish. Abdomen velvety black, narrowly oval, the second segment a little broader behind; first segment metallic, shining; second segment on the sides with a semi-oval bronze spot, extending on the lateral margins the whole length of the segment; third and fourth segments each with a large metallic, somewhat coppery, triangular spot on each side of the base; third segment with a small triangular spot in the middle behind, sometimes extending slenderly forward; fourth segment with a median stripe dilated on the hind margin; remaining segments shining. Hind legs blackish, the tibiæ and tip of femora yellowish or brownish; front and middle legs yellowish red, femora at base, and tip of tarsi, black; hind metatarsi in the male slightly thickened. Wings nearly hyaline.

Six specimens: Mount Washington (William Patton, G. Dimmock), Connecticut, and Pennsylvania (Keen).

Melanostoma cœrulescens, n. sp.

Habitat.—Colorado!

♂. Length, 8 to 9^{mm}. Face deep shining greenish blue; except the tubercle and cheeks, evenly covered with grayish pollen. Face in profile considerably projecting, the tubercle large; frontal triangle with long blackish pile, vertical triangle with light-colored pile; cheeks concave from before backwards below. Antennæ black, third joint brown, more or less yellowish below. Thorax bright shining metallic greenish blue, pile grayish white. Abdomen rather slender and elongate, the first and second segments of nearly equal width throughout, thence gradually narrowed to the end of the fourth segment; first segment greenish black; second segment subopaque black, on the sides in front broadly shining greenish blue, which color extends back very narrowly to the hind margin of the segment; near the middle of the segment on each side there is a small yellowish or whitish spot; third segment in the middle and behind opaque black, on the sides, on the anterior half or two-thirds, a large yellowish or whitish spot, separated from the front border by a shining space; fourth segment similar, its hind border, the fifth segment, and hypopygium, metallic shining green. Legs brownish or blackish, outer half of front and middle femora and the base of all the tibiæ reddish yellow; hind femora with a row of black bristly hairs behind; hind metatarsi thickened. Wings subhyaline; stigma brownish yellow.

Melanostoma mellinum. (Plate III, fig. 9.)

Musca mellina Linné, Fauna Suec., 1821; Scopoli, Entom. Car., 934; Schrank, Ins. Austr., 910.

Scaeva mellina Fabricius, Syst. Antl., 251, 12; Fallen, Syrph., 46, 20; Zetterstedt, Dipt. Scand., ii, 759, and viii, 3153, 62.

Syrphus mellinus Fabricius, Spec. Ins., ii, 433, 61; Entom. Syst. iv, 308, 110; (?) Meigen Syst. Beschr., iii, 331, 85; Schiner, Dipt. Austr. Verh. Z. B. Ges., vii, 355.

Scaeva scalaris Fabricius, Antl., 252, 14; Zetterstedt, Dipt. Scand., ii, 760, and viii, 3154, 63.

Syrphus scalaris Panzer, Fauna, xlv, 20; Meigen, Syst. Beschr., iii, 330, 83; Fabricius, Ent. Syst., iv, 308, 112.

Syrphus Iris Meigen, Syst. Beschr., iii, 320, 67.

Syrphus mellarius Meigen, Syst. Beschr., 328, 81.

Syrphus melliturgus Meigen, Syst. Beschr., iii, 329, 82.

Melanostoma mellina Schiner, Fauna Austr., i, 291.

Melanostoma scalaris Osten Sacken, Cat. Dipt., 121.

? *Melanostoma pruinosa* Bigot, Annales Soc. Ent. de Fr., 1884, 79.

Habitat.—Europe, North America!

♂, ♀. Length, 6 to 7^{mm}. Shining metallic or black green. Face perpendicular, lightly dusted on the sides with whitish; tubercle small. Frontal triangle a little prominent, gently pitted in the middle; front of the female but little narrowed behind, below the middle with a broad shallow transverse depression, on either side of which, near the eyes, whitish dusted, below narrowly connected with the dust of the face; elsewhere the front is shining. Antennae blackish brown, the third joint below often yellowish, sometimes the yellow prevails on the second joint, or rarely the whole antenna may be yellowish; arista yellow at base. Abdomen of the male with three pairs of large yellow spots, the first pair usually smallest and near the middle of the segment; second pair usually the largest, quadrangular; third pair similar, but smaller; these reddish yellow spots leave only the opaque black as a narrow median stripe and posterior cross-band; hind border of fourth, and the fifth segment, shining. Abdomen in the female more oval, wholly shining, with four pairs of red or yellowish spots; the first pair small, on each side of the middle, and not touching the lateral margins, second and third pairs touching the anterior margin, in shape like a right-angle triangle, the point directed back and broadly rounded; on the fifth segment smaller, nearly contiguous. Legs variable, reddish yellow (var. *scalare*) with brownish rings on the hind, or on all the tibiæ; or sometimes the legs, except the front pair, almost wholly brownish (var. *mellinum*), the base of the tibiæ lighter. Hind metatarsi in male not thickened. Wings tinged with brownish yellow, sometimes faintly, at other times deeply.

About 100 specimens from Europe, New England, Kansas, and the Pacific States. A very variable species in the color of the antennæ, legs, wings and abdominal spots, which explains the number of its synonyms.

As in Europe the species is very common; of them Schiner says (l. c.): "Die Lieblings aufenthalt dieser kleinen, schmalleibigen munteren Thiere sind Rohrbestände, doch finden sie auch an Bächen, in feuchten Wiesen und überhaupt überall, wo es üppigen Graswuchs und Blumen gibt. Ich habe tausende von allen möglichen Standorten eingetragen, sie fehlen auf keiner Excursion und langweilen endlich den armen Dipterologen, da sie scheinbar immer neu, bei genauerer Untersuchung doch weiter nichts als Varietäten derselben verändlichen Art scheinen."

The only difference that Bigot's description of M. *pruinosa* (♀) shows is "abdomen d'un noir opaque, base et extrémité un peu luisantes."

"*M. gracilis* Meigen and *M. maculosa* Meigen, both European, are stated to occur in North America by Mr. Walker, List, etc., iii, 588, 559. Mr. Verrall informs me that 'those two species are synonyms of *scalaris* Fab. [*M. mellinum*]. But Mr. Walker's *Syrphus maculosus* has two representatives in the British Museum, both *Platychiri*, one resembling *P. immarginatus* Zett., the other resembling *P. scambus* Staeger.'" Osten Sacken, Cat. Dipt., 122.

Melanostoma angustatum, n. sp. (Plate III, fig. 7.)

Habitat.—Washington Territory!

♂. Length, 9 to 10^{mm}. Allied to *M. mellinum*, but the face is more projecting, and the abdomen is longer and more slender. Face shining metallic greenish black, lightly dusted with white, nearly perpendicular, in the middle with a rather prominent, small tubercle; cheeks convex below. Frontal triangle gently swollen, with a small pit in the middle, and with black pile. Antennæ reddish yellow, the third joint at the outer end blackish. Thorax and scutellum bright metallic green. Abdomen narrow, elongate, attaining its greatest width at the end of the fourth segment; first segment, and the front part and sides of the second, bronze green, not much shining; second segment in the middle with two small oval yellow spots, behind subopaque black; third, with two elongate yellow spots, reaching from the front margin to beyond the middle of the segment, and touching the lateral margins in front; fourth segment similar, but the spots a little less elongate, and the posterior part and lateral margins of the segment shining green; the nearly-concealed fifth segment and the hypopygium shining green black. Legs sometimes wholly yellow, except a brownish ring on the front tibiæ; usually the front and middle femora and tibiæ with broad brown rings, and the hind femora and tibiæ with broad black rings; the front tarsi lightly, the hind tarsi except the tip of the first joint, darker, brownish; hind metatarsi scarcely at all thickened. Wings tinged with brownish, the stigma yellow.

Five specimens, Washington Territory (H. K. Morrison).

Melanostoma trichopus.

Syrphus trichopus Thomson, Eugenies resa, etc., 502.

Habitat.—California (Thomson). Niger, facie, abdominis maculis lateralibus scutelloque plumbeis, tibiis tarsisque anterioribus dilute fuscis. ♂. Long. 8–9 mill. Patria, California.

S. fenestrato MACQ. simillimus, thorace haud viridi, costa in apice ipso excurrente distinctus. Caput hemisphæricum, inferne breviter rostrato-productum, infra antennas vix impressum, tuberculo supra clypeum parvo; occipite opaco æneo-nigro; oculis fronte late cohærentibus, inferne ad os haud descendentibus, margine postico vix sinuato, albido-pruinoso; fronte supra antennas dense nigro-pilosa; epistomate nitido, æneo, lateribus parcius albido-pubescenti, apertura oris oblonga, antice constricta; genis linea obliqua impressa ab epistomate discretis; gula plumbea, pallido-pilosa. Antennæ basi paullo distantes, divaricatæ, subdeflexæ, nigræ, articulo 3:o elliptico brunneo, seta basi nigricante. Thorax plumbeo-niger, subopacus, fusco-pilosus; scutellum plumbeo-virescens, longius nigro-pilosum. Alæ abdomine longiores, griseo-hyalinæ, cellula post-costali obscure flava; costa in ipso apice alæ desinente, cellula discoidali nervum transversum ordinarium in quarta sua anteriore parte excipiente, nervo exteriore haud flexuoso et terminali apice extus appendiculo parvo instructis, hoc nervo exteriore basi inferno flexuoso; nervo spurio ante apicem cellulæ discoidalis abrupto, brachii abscissa 4:o ta nervo transverso breviore. Halteres nigri. Abdomen thorace dimidio longius, apicem versus angustatum, sat dense et longe præsertim basi fusco-pilosum, atro-holosericeum, segmentis 5:o brevissimo et 6:o totis, 2–4 maculis lateralibus prope basin plumbeo-schistaceis, his fascias sensim minus late interruptas formantibus. Pedes nigri, femoribus omnibus tibiisque posterioribus sate longe pilosis, *genubus, tibiis tarsisque anterioribus brunneo-fuscis. Pectus nitidum, plumbeum, parcius pilosum, plumula subalis et peritremate spiraculorum albidis.*—Thomson.

I cannot identify this species with any of the foregoing, though it comes nearest to *M. tigrinum.* It is more than probable that it will be found among those described by Bigot.

The following species, described by Mr. Bigot, probably belong to this genus; yet *Platychirus* should not be lost sight of in endeavoring to identify them. It is very probable that some of them are synonyms of species already described, but my material and patience are not sufficient to determine them. *M. pruinosum* I have given as a probable synonym of *M. mellinum.*

Melanostoma ? pruinosum.

Melanostoma ? pruinosa Bigot, Ann. Soc. Ent. Fr., 1884. 79.

Habitat.—California (Big.).

♀. Long. 8^{mm}. *Antennis fulvis, apice fuscis; fronte et facie nigris, nitidis, utrinque flavo pruinosis; thorace nigro, obscurè æneseente; calyptris albis, halteribus fulvis, clavâ fuscâ; abdomine nigro opaco, segmento 2°, utrinque, maculâ obliquâ, oblongâ, 3° et 4°, maculis utrinque latis, fere trigonis, 5°, lunulis lateralibus flavis; pedibus flavidis, femoribus tibiisque fusco annulatis, sæpè evanescentibus, tarsis posticis fuscanis, incisuris laté flavidis; alis hyalinis.*

Antennes fauves, bords supérieurs, extrémité et chète, bruns; front et face d'un noir luisant, couverts de chaque côté par une pruinosité jaunâtre qui s'étend notablement au-dessus des antennes; thorax, écusson d'un noir luisant à reflets bronzés; flancs à duvet blanchâtre; cuillerons blancs, balanciers fauves, massue brunâtre; abdomen d'un noir opaque, base et extrémité un peu luisantes, 2^{e} segment avec deux macules obliques, ovaloïdes, divergentes du côté antérieur, 3^{e} et 4^{e}, avec deux larges macules basilaires, trigonales, joignant les côtés, d'un jaune fauve; pieds testacés, cuisses et tibias avec des anneaux brunâtres parfois peu distincts, tarses avec l'extrémité brunâtre, les postérieurs plus foncés avec les articulations largement jaunâtres; ailes hyalines. Antennes, 3^{e} segment ovale; abdomen étroit; ailes dépassant à peine son extrémité. Californie—2 specim.

Melanostoma ? pictipes.

Melanostoma ? pictipes Bigot, Ann. Soc. Ent. Fr., 1884, 78.

Habitat.—California (Big.).

♂. Long, 9^{mm}. *Nigra, parum nitida. Antennis castaneis; fronti nitidâ; facie, utrinque cinereo pruinosâ; calyptris et halteribus fulvis; abdomine nigro opaco, basi albido pilosula, apice et utrinque nitido; maculis basalibus, utrinque, ferè trigonis, cinereis parum metallescentibus; pedibus fulvis, femoribus tibiisque latè fusco nigro annulatis tarsis apice infuscatis, posticis fuscis; alis ferè hyalinis, maculâ stigmaticali testaceâ.*

Antennes noires, 3^{e} segment et chète d'un fauve obscur; front noir, luisant à poils noirs; face noire, callosité luisante, côtés à reflets gris-

tres; thorax, écusson, d'un noir un peu bronzé, couverts d'un duvet clairsemé roussâtre, flancs à duvet gris, une petite touffe de poils blancs sous les cuillerons, ces derniers, ainsi que les balanciers, testacés; abdomen d'un noir opaque, muni de duvet blanchâtre, principalement à sa base, 1er segment, bords latéraux, marges des 4^{e} et 5^{e}, luisants, 3^{e} et 4^{e}, de chaque côté, avec une macule basilaire trigonale joignant les côtés et d'un gris d'acier; pieds fauves, cuisses et tibias avec un large anneau noirâtre, tarses noirs à l'extrémité, postérieurs châtains; ailes presque hyalines, macule stigmatique étroite, allongée, roussâtre. Antennes, 3^{e} segment ovalaire, oblong; abdomen étroit; ailes ne dépassant pas son extrémité. Californie—4 specim.

Melanostoma ? bicruciatum.

Melanostoma ? bicruciata Bigot, Ann. Soc. Ent. Fr., 1884, 79.

Habitat.—California (Big.).

♂ Long. 7^{mm}. *Antennis fulvis, apice fuscis; facie et fronte nigris, nitidis, utrinque cinereo pruinosis; thorace scutelloque nigris, obscurè ænescentibus; calyptris et halteribus testaceis; abdomine nigro opaco, basi et apice anguste nitido, utrinque maculis tribus latis, quadratis, fulvis; pedibus fulvis, femoribus tibiisque latè fusco pallido annulatis, tarsis apice parum infuscatis; alis hyalinis.*

Antennes fauves, brunes en dessus et à l'extrémité du 3^{e} segment, chète brun; front d'un noir luisant; face de même avec reflets d'un gris pruineux sur les côtés; thorax, écusson, noirs à reflets bronzés; cuillerons et balanciers testacés; abdomen d'un noir opaque, 1er segment, bords postérieurs des 4^{e} et 5^{e} luisants, six larges macules carées, atteignant les côtés, fauves; pieds fauves, cuisses et tibias largement annelés d'un brun lavé, extrémité des tarses brune; ailes hyalines, stigmate fort pâle. Antennes, 3^{e} segment ovalaire; abdomen étroit, oblong, ailes ne dépassant pas son extrémité. Californie.—1 specim.

Melanostoma ? rostratum.

Melanostoma ? rostrata Bigot, Ann. Soc. Ent. Fr., 1884, 80.

Habitat.—California (Big.).

♀. Long. 7^{mm}. *Facie prominente, obtusâ. Antennis fulvis, basi et supernè infascatis; fronté et facie nigro-nitido, utrinque cinereo pruinosis; thorace scutelloque nigris, obscurè æneis halteribus pallidè testaceis; abdomine nigro opaco, apice augusté nitido, lineâ tenui, dorsali, cinerascente, utrinque maculis tribus latis, ferè quadratis, cinerascentibus et obscurè testaceo pictis; pedibus fulvis, femoribus posticorum intermediorumque, tarsis basi, apice, nigris, tibiis, late pallide fusco annulatis pedibus posticis nigris, geniculis fulvis; alis hyalinis maculâ stigmaticali elongatâ, testaceâ.*

Resemble à la *M. ? pictipes*, mais en diffère surtout par la face, qui se prolonge sensiblement en avant sous la forme d'un obtus. Antennes fauves, noirâtres à la base et en-dessus, chète brun; front d'un noir luisant ainsi que la face, celle-ci à reflets gris sur les côtés; thorax, écusson, noirs à reflets bronzes, flancs à duvet blanchâtre; cuillerons blancs, balanciers testacés; abdomen d'un noir mat, premier et dernier, segments un peu luisants, une ligne médiane, étroite, grisâtre, et, latéralement, trois larges macules carrées, atteignant les bords, d'un gris à reflets fauves; pieds antérieurs et intermédiaires fauves avec, la base des cuisses, l'extrémité des tarses, noires, un large anneau brunâtre aux tibias, pieds postérieurs noirâtres avec les genoux fauves; ailes hyalines; macule stigmatique d'un jaunâtre pâle; 3^{e} segment des antennes allongé, ovaloïde; abdomen étroit, déprimé, plus court que les ailes. Californie.—1 specim.

Melanostoma ? pachytarsis.

Melanostoma ? pachytarsis Bigot, Ann. Soc. Ent. Fr., 1884, 80.

Habitat.—California (Big.).

♀. Long. 7^{mm}. *Antennis fulvis, apice nigris; facie et fronte nigro nitido; thorace scutelloque nigris, obscurè æneis; calyptris albis, halteribus pallidè flavis; abdomine nigrò,* 2^{o} *segmento maculis duo rotundatis,* 3^{o} *et* 4^{o} *basi, utrinque, maculis ferè trigonis,* 5^{o} *basi, lunulis duo fulvis; pedibus fulvis, metatarso postico parum incrassato, femoribus tibiisque posticis laté nigro annulatis, tarsis omnibus nigris, incisuris fulvis; alis hyalinis, maculâ longâ stigmaticali pallidè testaceâ.*

Antennes fauves, extrémité du 3^{e} segment et chète noirs; front et face d'un noir luisant; thorax, écusson, noirs avec reflets bronzés; cuillerons blanchâtres, balanciers d'un jaune pâle; abdomen noir, premier et dernier segments luisants, 2^{e} avec deux points ronds, 3^{e} et 4^{e} avec, de chaque côté, une large macule trigonale basilaire, n'atteignant pas les bords latéraux, le sommet dirigé en arrière, 5^{e} avec deux lunules basilaires fauves; pieds fauves, cuisses et tibias postèrieurs largement annelés de noirâtre, tibias antérieurs et intermédiaires avec les pâles vestiges de semblables anneaux, tous les tarses noirâtres avec leurs articulations fauves; ailes presque hyalines, stigmate étroit, allongé, d'un jaunâtre pâle. Antennes, 3^{e} segment court, ovaloïde; abdomen étroit, déprimé; ailes le dépassant notablement; métatarses postérieurs légèrement épaissis. Californie.—1 specim.

ADDITIONAL NORTH AMERICAN SPECIES.

Melanostoma ? anthracoides Bigot, Ann. Soc. Ent. Fr., 1884, 82.—Panama.
Melanostoma ? annuliferum Bigot, ibid., 84.—Mexico.
Melanostoma ? cruciatum Bigot, ibid., 81.—Mexico.
Melanostoma ? quadrinotatum Bigot, ibid., 77.—Mexico.

PYROPHÆNA.

Pyrophæna Schiner, Wien. Ent. Monatschr., iv, 213, 1860.

Medium sized, black, nearly bare species, with ferruginous or orange yellow bands on the abdomen. In structure closely allied to Melanostoma and Platychirus, but distinguished by the much larger, more promi-

nent vertical triangle, the ocelli being situated further forward, by the flattened abdomen, which is long oval in shape and more narrowed towards its base, so that its greatest width is attained at the end of the third segment; the wings also are shorter and broader, scarcely projecting beyond the end of the abdomen. The tarsi of the male may be either flattened or simple. Type of genus *P. ocymi* (Fabr.) Schiner.

Our two species are also European, and the only known ones in the genus. The genus, taxonomically, is equivalent to Melanostoma and Platychirus combined. The flies are apparently rare; I have but two specimens collected in this country.

TABLE OF SPECIES.

Abdomen largely reddish yellow; front and middle tarsi of the male flattened..**ocymi.**
Abdomen black, with two reddish yellow spots on the third segment; front metatarsi of male not flattened..**rosarum.**

Pyrophæna rosarum.

Syrphus rosarum Fabricius, Mantissa Ins., ii, 341, 71; Entom. Syst. iv, 307, 109; Meigen, Syst. Beschr. iii, 338, 94; Panzer, Fauna, cviii, 14; Macquart, Hist. Nat. Dipt. i, 545, 39; Walker, Ins. Brit. i, 296, 30; Schiner, Verh. Z. B. Ges. vii, 357.

Syrphus noctilucus Panzer, Fauna, lxxii, 24 (male).

Scaeva rosarum Fabricius, Antl., 351, 11; Fallen, Syrph. 47, 22; Zetterstedt, Dipt. Scand. ii, 755, and viii, 3152, 58.

Pyrophœna rosarum Schiner, Wien. Ent. Monatschr., iv, 213; Fauna Austr. i, 298; Osten Sacken, Cat. Dipt., 122.

Habitat.—Europe, North America (O. S.).

♂, ♀. Length, 8 to 9^{mm}. Antennæ black, the third joint below somewhat lighter colored. Face metallic blue, straight, the tubercle little prominent. Thorax with two approximate whitish stripes. Abdomen velvet black, with the exception of two reddish yellow spots on the third segment, and the last segment, shining. Legs black, yellow at base of tibiæ. Wings tinged with grayish, in the middle with a darker spot. Thorax shining dark green; scutellum with a blue reflection. In the female the legs chiefly steel-blue; four front tibiæ yellow or yellowish-brown, their tarsi almost wholly yellow.—Translation.

I do not know this species.

Pyrophæna ocymi. (Plate III, figs. 13, 13*a*, 13*b*, 13*c*.)

Syrphus ocymi Fabricius, Syst. Ent., iv, 309, 114; Panzer, Fauna, lxxxii, 18; Meigen, Syst. Beschr. iii, 337, 93 (female); Macquart, Hist. Nat. Dipt., i, 546, 40; Schiner, Verh. Z. B. Ges., vii, 362.

Syrphus lobatus Meigen, Syst. Beschr., iii, 336, 92 (male).

Scæva ocymi Fabricius, Antl., 252, 18; Fallen, Syrph., 48, 23; Zetterstedt, Dipt. Scand., ii, 754, and viii, 3152, 57.

Syrphus granditarsus Walker, Ins. Brit., i, 295, 29.

Platycheirus ocymi Stæger, Kröj. Tidsskr., iv, 320.

Pyrophœna ocymi Schiner, Wien. Ent. Monatschr., iv, 213; Fauna Austr., i, 297.

Habitat.—Europe, North America!

♂, ♀. Length, 8 to 9^{mm}. Metallic black. Antennæ brownish black, third joint convex below, nearly rectangular at the end above. Face bluish black, in the female more metallic blue, with thin, whitish dust, nearly perpendicular in profile with a prominent, well-defined tubercle, and a smaller one below it. Frontal and vertical triangles with black pile; front in the female with black pile, except at the vertex. Dorsum of thorax with three opaque stripes in the male, wholly bright shining metallic green in the female. Scutellum shining bluish metallic green. First segment of the abdomen shining black; second segment with an anterior black cross-band, convex or dilated in the middle behind; in the male the remainder of the second segment, the third, and the anterior part of the fourth, are orange yellow; in the female on the posterior angles of the second with smaller, of the third with larger, black spots, the fourth and fifth segments with an interrupted, anterior, not broad, cross-band. Legs in the male black, with the base of all the tibiæ yellow; the front metatarsi extraordinarily dilated, and with a process directed inward, the remaining joints as usual; the middle metatarsi also considerably dilated, the remaining joints successively less so; posterior metatarsi a little thickened, somewhat elongate. In the female the legs are reddish yellow, the front tarsi, the last four joints of the middle tarsi, a ring on the hind tibiæ, and the hind tarsi, black, sometimes also a less distinct ring on the hind femora; in structure the legs show no peculiarities. Wings tinged with reddish brown, darker in the middle.

Two specimens from Holland (v. d. Wulp), a single female specimen from Washington Territory (Morrison), and a female from Labrador (Henshaw).

PLATYCHIRUS.

Platycheirus St. Fargeau and Serville, Encycl. Meth.. x, 513, 1825.

Medium sized to rather small species, elongate, nearly bare, black or metallic green, with yellow, reddish, or whitish yellow spots on the abdomen. Wholly like *Melanostoma*, except in the structure of the legs. In the male the tibiæ are more or less dilated in the front pair, the front metatarsi always, and the remaining joints more or less, so; in the female the front tibiæ and metatarsi, though not dilated as in the male, are comparatively broader than those in *Melanostoma*.

TABLE OF SPECIES.

1.—Front tibiæ in the male gradually dilated from the base, the tarsi gradually decreasing in width from the base to the tip; profile of the face only gently concave above the tubercle, the latter small; cheeks convex below . . 2

Front tibiæ of the male slender, suddenly dilated at the tip, metatarsi much dilated, the remaining joints but slightly so; the front femora in the male with a thick row of hairy pile on the posterior side; face in both sexes with a conspicuous tubercle; cheeks concave below . . . . peltatus

2.—Front tibiæ of the male, on the inner side toward the end, somewhat concave, the outer angle produced into a lappet-like process; yellow spots on the abdomen in both sexes very large, leaving only a median stripe and cross-bands; hind femora and tibiæ yellow . . . . **quadratus**

Front tibiæ of the male gently and evenly convex on the inner side, the tip on the outer side less produced, more angular; spots of abdomen smaller, hind legs chiefly black 3

3.—Front femora in the male with a row of five to seven long bristly hairs; second abdominal segment with large, the fifth with small yellow spots . . . **chætopodus**

Front femora without such bristles; second segment of the abdomen in both sexes with a small rounded spot on each side, fifth segment in the male without yellow . . . . **hyperboreus**

For other species, see description.'

Platychirus quadratus. (Plate III, figs. 10, 10 *a.*)

Scæva quadrata Say, J. Acad. Phil., iii, 90, 4, Compl. Wr., ii, 79.
Syrphus quadratus Wiedemann, Auss. Zw. Ins., ii, 135, 32.
Syrphus fuscanipennis Macquart, Dipt. Exot., 5e Suppl., 95, 58.
Platychirus quadratus Osten Sacken, Cat. Dipt., 122.

Habitat.—Eastern, Middle and Pacific States!

♂, ♀. Length, 7mm. Face deep shining green, thickly covered with yellowish pollen; in profile a little receding, tubercle very little prominent. Antennæ brownish black. Frontal triangle yellowish pollinose and with black pile; front in female shining, with a somewhat coppery reflection, pollinose on the sides below, and dilated inwardly near the middle. Thorax deep shining metallic green; pleuræ with whitish or grayish pollen Scutellum like the thoracic dorsum. Abdomen with three large pairs of quadrate, orange-yellow spots, leaving a longitudinal stripe and three cross-bands shining black, which in some specimens are slender, brown, or even obsolete; in the female the black cross-bands are often dilated in the middle, and narrowed on the sides; the fifth segment with a median black stripe, dilated behind, or wholly orange colored; sixth segment in female small, reddish yellow; hypopygium shining greenish black. Legs reddish yellow; the first and last two joints of the hind tarsi black; the hind tibiæ sometimes with one or two blackish rings. In the male the front tibiæ are gradually dilated, convex on the outer border below, gently concave on the inner side, the outer angle below produced downward; tarsi dilated, gradually narrowed from base to tip; the hind metatarsi in the male also thickened. Wings with a brownish tinge across the middle.

Numerous specimens from New England, Kansas, California, &c.

Platychirus hyperboreus. (Plate III, fig. 12.)

Syrphus hyperboreus Staeger, Groenl. Antl., 362, 30.
Scæva hyperborea Holmgren, Ins. Nordgrœnl., 100.
Platycheirus hyperboreus Staeger, Kröj. Tijds., N. Rakke, i, 346.

Habitat.—Greenland (Stäger), New York (O. S.), Colorado, Pennsylvania, White Mountains!

♂. Length, 8 to 9mm. Deep shining metallic green. Face rather thickly covered with yellowish gray pollen, leaving only the tubercle and the cheeks in front more shining. Face somewhat receding in profile, the tubercle inconspicuous; cheeks convex below. Antennæ brownish black. Frontal triangle pollinose, with black pile. Abdomen opaque black; the first and fifth segments and the hypopygium shining greenish black; second segment with a small rounded spot on each side; third segment with a large quadrate spot in front reaching to a little beyond the middle; fourth segment similar, the spots scarcely reaching beyond the middle; fifth segment shining, wholly without yellow. Front legs yellow, the tibiæ gradually and nearly evenly dilated from the base to the tip, the external angle below not produced, metatarsi moderately dilated, thence gradually narrowed to the tip; middle legs yellow, blackish toward the base; hind legs black, the tip of femora, the base and tip of tibiæ, tip of metatarsi and the second and thirds joints, yellow. Wings nearly hyaline; stigma dilutely yellow.

♀. Like the male but the abdominal spots smaller, sometimes wanting on the second segment, the fifth segment also with a pair of spots; the legs with less black, and the fore legs not dilated. The front and middle legs are wholly yellow, and the black on the hind legs confined to a ring on the femora and tibiæ and with the metatarsi blackened.

Six males and one female from Colorado, four females and one male from the White Mountains, New Hampshire, July 25–30, and one female from Pennsylvania (Keen).

This species is closely allied to *P. chætopodus*, but differs in the male in the front femora not having the row of conspicuous bristly black hairs on the outer side and in the spots on the fifth abdominal segment being wanting; in both sexes by the spot on the second segment being small, rounded, or subtriangular.

Platychirus peltatus. (Plate III, figs. 11, 11*a*.)

Syrphus peltatus Meigen, Syst. Beschr., iii, 334.
Scæva albimana Fallen, Syrph., 46, 19.
Scæva peltata Zetterstedt, Dipt. Scand., ii, 747; viii, 4145, 50.
Platycheirus peltatus Stäger, Kröj. Tijdschr., iv, 320; Schiner, Dipt. Austr., i, 295.

Habitat.—Northern Europe, White Mountains, Pennsylvania, New York!, Sitka (Lw.).

♂, ♀. Length, 8 to 9^{mm}. Metallic shining green. Antennæ blackish brown, the third joint somewhat lighter or yellowish below. Face thickly covered with yellowish dust, leaving the tubercle and cheeks in front more shining; in profile, concave below the antennæ, with a prominent tubercle and a smaller one below it, near the oral margin. Frontal triangle bronze colored, but little shining, the pile black; front with a slight coppery or bronze reflection; dusted on the sides below, dilated in the middle so that there is only a narrow shining space between the two. Thorax bright, shining, metallic green. Abdomen in the male opaque black, shining metallic green on the first, tip of fourth, the fifth, and the sixth segments; in the female wholly moderately shining. Second segment with a moderately large yellow spot on each side, third and fourth with larger quadrate spots, situated on the front part; in the female these spots, except the first pair, are smaller, and in addition, on the fifth segment, there is a small, oval spot on each side in front, which is scarcely apparent in the male. In the male the front femora are yellowish, with more or less black toward the base, and on their posterior part for nearly their whole length there is a row of rather long, thickly set, black pile; the tibiæ yellowish, slender, suddenly and moderately dilated at the tip; the metatarsi elongated and extraordinarily dilated, produced into an acute angle on the inner distal corner; second joint a little dilated, the remaining joints not at all; the first two joints whitish, the remainder reddish yellow. Middle femora of the male black at the base, otherwise yellow; below, near the middle, somewhat excavated, and for a short distance with a row of short bristles; the tibiæ yellow, on the inner side, just before the middle, suddenly narrowed, and again, a little less suddenly, widened before the tip; hind legs blackish brown with yellow knees, their metatarsi thickened, especially toward the base. In the female the legs are simple, only the middle tibiæ slightly narrowed on the inner side and the hind metatarsi a little thickened; the first two pairs of legs nearly wholly yellow, the hind pair, except the base and knee, blackish brown; the spots on the abdominal segments are also some what smaller. Wings hyaline, stigma light yellowish.

Two specimens from Holland, and one male and twenty-five females from the White Mountains, New Hampshire (July 25–30).

Also, several males and females from Pennsylvania (Mr. E. Keen).

Platychirus chætopodus, n. sp.

Habitat.—Washington Territory !.

♂. Length, 8^{mm}. Deep shining metallic green. Face thickly covered with yellowish dust, a small spot on the tubercle bare and shining. Antennæ brownish black. Frontal triangle more greenish, less thickly pollinose, with black pile. Thorax and scutellum bright shining metallic green. Abdomen opaque black, with four pairs of yellow spots; first segment shining greenish metallic; second segment with two large triangular spots, leaving the black nearly the whole width of the segment in front and narrowed behind, on the posterior border a rather narrow black cross-band; third and fourth segments similar, except that the spots are more nearly quadrilateral, the black only a little widened in front, and the posterior bands a little broader, so that in the fourth segment it occupies about one-third of the width of the segment; fifth segment with two yellow spots, leaving only a posterior shining greenish black triangle, extending narrowly to the front margin; hypopygium shining metallic green. Legs yellow; the middle femora with a small blackish spot toward the base, hind femora and tibiæ with a broad black ring, hind metatarsi, except their tip and last two joints of hind tarsi, black; front femora on their hind border with a row of four or five long bristly black hairs, front tibiæ gradually dilated, the inner border more sinuate than in *P. hyperboreus*, the outer angle at the tip moderately acute, their metatarsi moderately dilated, thence gradually narrowed to the tip of tarsi; hind metatarsi thickened. Wings faintly brownish tinged.

Two specimens, Washington Territory. This species will be distinguished from *P. hyperboreus*, to which it is most nearly allied, by the large spot on the second abdominal segment, by the presence in the male of spots on the fifth segment, by the bristles on the front femora of the male, by the external angle of the front tibiæ not being produced lappet-like. From *P. peltatus*, the front legs in the male and the facial profile will at once distinguish it.

Platychirus ciliatus.

Platycheirus ciliatus Bigot, Annales Soc. Ent. Fr., 1884, 74.

Habitat.—California (Bigot), Colorado!

♂. Length, 8^{mm}. Face nearly uniformly gray pollinose. Third joint of antennæ twice as long as wide, partly reddish. Dorsum of thorax and scutellum shining brassy black. Abdomen contracted in the middle, opaque black; the first segment, the sides of the second, the fifth segment, and the hypopygium, shining metallic. Second segment on the sides with a small spot, third and fourth in front with a larger, oblique lateral spot, yellow. Legs yellow; the front and middle femora in part, the hind pair chiefly, black; front femora on the outer side with a rather dense and long row of black pile; front tibiæ with a tuft of black pile without beyond the middle, considerably dilated on last fourth, squarely truncate at the tip; front metatarsi much dilated, squarely truncate, second joint very short and transversely dilated to the full width of the metatarsus, the next two joints successively less dilated; middle tibiæ arcuate on outer half; hind metatarsi thickened and elongate. Wings hyaline.

♀. Antennæ black. Abdomen with a pair of quadrate spots on the third and fourth segments, the spots on the second small or obsolete. Femora black, except the tip; intermediate, and especially the hind tibiæ, brown in the middle; hind metatarsi elongate.

Three specimens, Colorado (National Museum, Professor Riley's collection). The color of the legs probably varies somewhat. This species is very probably the one described as *P. ciliatus* by Bigot, but as the author omits the most distinctive characters (the structure of the fore legs), and as his types were from California, it will be well to reproduce his description.

P. ciliatus. ♂. Long. 8^{mm}. *Niger. Antennis, segmento* 3° *subtùs fulvo obscurè notato; facie cinereo pruinoso; thorace scutelloque nitidis, fusco villosis; calyptris et halteribus cinereis, clavâ nigrâ; abdomine nigro opaco, albido longè villosulo, maculis utrinque tribus trigonis, cinereis, segmento* 5° *nitido; femoribus anticis, subtùs, longè nigro villosis, pedibus anticis intermediisque testaceis, femoribus et tibiis intermediis latè nigro* *annulatis, anticis, latis, testaceis, utrinque nigro marginatis, tarsis anticis, latis, testaceis, basi nigro pariter marginatis, pedibus posticis nigris; alis pallidè cinereis, maculâ stigmaticali pallidè fuscâ.*

Noir. Antennes, 3^e segment avec une macule fauve en dessous; face assez luisante, à reflets gris; bords des orbites postérieurs à duvet blanc; thorax, écusson, luisants, d'un bronzé obscur avec de longs poils clairsemés brunâtres, flancs à duvet blanchâtre; cuillerons et balanciers grisâtres, massue noire; abdomen d'un noir opaque avec de longs poils clairsemés blanchâtres vers la base, ler et dernier segments luisants, 2^e, 3^e et 4^e avec, de chaque côté, une macule trigonale grise; cuisses antérieures testacées avec un large anneau noir, et, en dessous, de longs cils noirs, tibias testacés, élargis, bordés de noir, tarses et métatarses antérieurs, fort élargis, testacés, les derniers bordés de noir, pieds intermédiaires avec les cuisses presque totalement noires, des poils clairsemés blanchâtres aux tibias, un large anneau, tarses à l'extrémité, noirs, pieds postérieurs entièrement noirs, avec les cuisses munies de poils blancs clairsemés; ailes un peu grisâtres, stigmate d'un jaunâtre obscur. Abdomen étroit. Californie.—1 specim.

The legs of Bigot's specimen are more black, and the abdominal spots perhaps lighter colored; otherwise it seems to be similar.

Platychirus Naso Walker, List, etc., iii, 587 (*Syrphus*).—Huds. B. Terr.
Platychirus Pacilus Walker, Dipt. Saunders, 240 (*Syrphus*).

"These are both *Platychiri;* whether they differ from *P. peltatus* and *quadratus*, I am unable to tell, as I had no specimens for comparison when I saw the types in the British museum."—Osten Sacken, Cat. Dipt., p. 244, note 201. These species can hardly be determined from Walker's descriptions, and it does not seem worth while to reproduce them.

LEUCOZONA.

Leucozona Schiner, Wien. Ent. Monatschr., vi, 214, 1860.

Rather large, thickly pilose species; black, with a broad yellow band at the base of the abdomen. Head hemisperical, somewhat broader than the thorax. Antennæ porrect, short, third joint oval; arista basal, bare. Face in both sexes broad, yellow, with black cheeks and median stripe; grayish pollinose, pilose; in profile perpendicular, somewhat protuberant below, produced considerably downwards below the eyes, tuberculate. Eyes pilose, contiguous in the male. Thorax scarcely longer than broad. Scutellum reddish yellow, translucent. Abdomen elliptical, depressed, broadest beyond the middle, not more than twice as long as the thorax. Wings with open marginal cell, third longitudinal vein very gently curved, small cross-vein near base of discal cell, first posterior cell closed some distance before the costa. Type of genus, *L. lucorum* (Linné).

Leucozona lucorum. (Plate III, figs. 6, 6*a*.)

Musca lucorum Linné, Fauna Suec., 1803, 1761.

Conops praecinctus Scopoli, Entom. Carn., 908.

Syrphus lucorum Fabricius, Spec. Ins., ii, 426, 25; Entom. Syst., iv, 291, 46; Meigen, Syst. Beschr., iii, 313, 58; pl. xxx, fig. 27; Macquart, Hist. Nat. Dipt. i, 537, 8.

Eristalis lucorum Fabricius, Antl. 241, 37; Fallen, Syrph., 50, 1; Zetterstedt, Dipt. Scand., ii, 778, and viii, 3166, 1.

Cheilosia lucorum Walker, Ins. Brit., i, 281, 1; Curtis, Brit. Ent., 753.

Leucozona lucorum Schiner, Wien. Ent. Monatschr., vi, 214; Fauna Austr., i, 299.

Habitat.—Washington Territory! Canada (O. S.), Northern and Central Europe.

♂, ♀. Length, 12^{mm}. Antennæ black, third joint oval; arista black. Face gently concave below the antennæ, the tubercle large, obtuse, nearly as low down as the lower border of the eyes; color concealed on the sides beneath very dense white pollen, and yellowish white pile, the middle part and the cheeks bright shining blue black, frontal triangle less dusted. "Front in female yellowish anteriorly, gradually becoming darker behind." Thorax opaque black, thickly covered with reddish yellow pile, beneath which the dark greenish brown pollen leaves three slender black stripes. Pile on the pleuræ white, on the scutellum bushy yellow or orange. Abdomen black, shining, the second segment either wholly light yellow or wholly sub-opaque bluish gray, or light yellow in the middle part and bluish gray on the sides, with a slender black stripe on the middle not reaching the posterior margin; pile long, abundant, yellow and black. Legs black; tip of femora and base of tibiæ whitish yellow, sometimes almost wholly yellow. Wings hyaline with a blackish brown spot, reaching from the base of third posterior cell to the stigma; stigma darker.

Two ♂ specimens, Washington Territory, Colorado.

CATABOMBA.

Lasiophticus Rondani, Prodrome, ii, 137, 1857 (ex parte).

Catabomba Osten Sacken, West. Dipt., 325, 1877.

Rather large species, closely resembling in appearance and structure the genus Syrphus, except that in the male the eyes have an area of enlarged facets above, the front in both sexes remarkably convex, and the hypopygium of the male is very small, concealed entirely beneath the fifth segment of the abdomen. Type of genus, *C. pyrastri* Linné.

In response to a request in regard to the claims of Lasiophticus Rond., for priority over Catabomba, as put forward by Bigot, Baron Osten Sacken has kindly given me his views on the retention of Catabomba, which I take the liberty of reproducing here nearly entire.

"The genus Lasiophticus was characterized by Rondani (Prod. ii, 137), thus: 'It shares the characters of Syrphus and Platychirus, but differs from the former in not having dilated front tibiæ and tarsi, from both by more or less pubescent eyes.' Eleven species were enumerated by Rondani as belonging to Lasiophticus, including the so-called *topiarius* M. (my *S. torvus*), *glaucius* F., *pyrastri* Lin., etc. In other words, all the European Syrphus (in the restricted sense of Schiner) that have pubescent eyes are Lasiophticus Rond. (see Schiner, i, 301).

"Now I have shown in my paper on Syrphus (Proc. Bost. Soc., N. H.), and, before me, Mr. Malm has done the same, that the pubescence or non-pubescence of the eyes in Syrphus is a character of altogether subordinate value; I mean to say that if we introduce a subdivision on the basis of this character, most evidently allied species, perhaps merely seasonal varieties, like *S. ribesii* and *S. torvus*, are torn asunder, and dissimilar forms like *pyrastri* and *glaucius* thrown together. In my opinion, therefore, the genus Lasiophticus must be given up.

"The question whether Catabomba is to be maintained or not has nothing to do with that of the validity of Lasiophticus. Catabomba was introduced by me on the ground of the peculiar structure of the facets of the eyes in the male, of front in both sexes, and of the male genitals. *S. pyrastri*, *S. selenitious*, and probably also *S. gemellarii* Rond. [*S. melanostoma* (Macq.) v. d. Wulp, also] partake of these characters. The eyes of these species are all pubescent, so far as I know; but then a Catabomba with glabrous eyes may be discovered and will be nevertheless a Catabomba; it could not be a Lasiophticus Rond.

"I believe, therefore, it would be expedient at present to retain the genus Syrphus in the sense of Schiner, and to drop Lasiophticus. It seems to me that we render Syrphus in this restricted sense more homogeneous if we separate Catabomba from it, just as Schiner separated Leucozona and other small genera. General habit and coloring of Catabomba, as well as its remarkable geographical distribution, confirm me in the belief that the species are subject to some peculiar law, and that it is only right to isolate them in our systematic arrangement."

It is true that Rondani used *S. pyrastri* as one of the typical species of his genus, and also pointed out one of its special characters—the tumid front in the male, in his tabular arrangement of the species (Prod. ii, 138); but for all that his genus can not and never would be accepted, except by the use of characters pointed out by Osten Sacken in his definition of Catabomba. It perhaps might have been better had Baron Osten Sacken used the name Lasiophticus instead of Catabomba; the name, however, in itself might become strongly objectionable. Certainly the pilosity of the eyes is not a generic character.

Catabomba pyrastri. (Plate IV, figs. 1, 1*a*.)

Musca pyrastri Linné, Fauna Suec., 1817; Scopoli, Entom. Carn., 931; Schrank, Enum. Ins. Austr., 447, 907.
Musca rosæ Degeer, Ins. vi, 6; pl. vi, figs. 14–21.
Syrphus pyrastri Fabricius, Spec. Ins. ii, 432, 58; Entom. Syst., iv, 305, 102; Meigen, Syst. Beschr., iii, 303, 44; Macquart, Hist. Nat. Dipt., i, 536, 3; Schiner, Verh. Z. B. Ges. vii, 338; Fauna Austr., i, 301.
Syrphus unicolor Curtis, Brit. Ent., 509, var.
Syrphus transfugus Fabricius, Entom. Syst., iv, 306, 104.

Scæva pyrastri Fabricius, Antl., 249, 3; Fallen, Syrph., 39, 5; Zetterstedt, Dipt. Scand., ii, 703, and viii, 3132.
Scæva transfuga Fabricius, Antl., 250, 5.
Scæva affinis Say, J. Acad. Phil., iii, 99, 9; Compl., ii, 81.
Syrphus affinis Wiedemann, Auss. Zw. Ins., ii, 117, 2.
Lasiophticus pyrastri Rondani, Ann. d. Acad. d. Aspir. Nat., iii.
Catabemba pyrastri Osten Sacken, Western Dipt., 325.

Habitat.—Kansas, Colorado, Wyoming, Washington Territory, Oregon, Utah, Arizona !, Scandinavia (Zett.), England (Walk.), Germany (Schiner), France, Algiers, Chili (Macq.), Italy (Rond.), Canary Islands (Webb and Berthelot).

♂, ♀. Length, 11 to 12mm. Face light yellow, somewhat bluish opalescent, often in dried specimens with a reddish tinge, a brown spot on the tubercle extending more broadly to the oral margin; pile abundant, whitish. Cheeks greenish black. Antennæ brownish black, often red on the under side of the first, second, and the third joint near the base; arista red. Front yellow, with a slender line reaching from the antennæ to the vertex or commissure, on each side of which the front is broadly subtranslucent olivaceous, the vertex black; pile black, in the male longer and more abundant. Eyes of male contiguous for about half as long a distance as the length of the frontal triangle; posterior orbits whitish pollinose, and with a fringe of white pile, longer below. Thorax shining greenish black, the humeri and post-alar callosities sometimes reddish; pile white, rather long and abundant. Scutellum yellow, very translucent bluish opalescent, the pile in large part blackish. Abdomen black, subopaque, with three pairs of arcuated whitish yellow spots, rather narrowly separated from each other, and more so from the lateral margins; the spots on the third and fourth segments are oblique, deeply concave in front, gently convex behind, inner ends rounded, approaching the front borders of the segments, the outer ends broader, truncate; fourth and fifth segments narrowly yellow behind; the first segment, the hind margins of the second, third, and fourth, dilated in the middle, and the remainder of the abdomen, more shining, somewhat metallic. Legs reddish yellow; basal half of front and middle femora and the hind femora, except the tip, black; all the tarsi brown, sometimes blackish, the metatarsi often reddish. Wings pure hyaline, the subcostal cell light yellowish, third vein with a long, moderately deep curvature.

Thirty specimens.

The facial stripe sometimes extends to above the middle of the face; the front of the female has sometimes a distinct brownish cast, and just above the antennæ not unfrequently brown.

EUPEODES.

Eupeodes Osten Sacken, West. Dipt., 328, 1877.

Very like species of Syrphus, but differs in the terminal abdominal segments. Head hemispherical; eyes bare, extending the whole vertical diameter, a little convergent below, without area of enlarged facets in the male, contiguous in this sex. Front a little convex; frontal triangle large. Antennæ short, third joint large oval. Face slightly concave below the antennæ, obtusely tuberculate. Scutellum much raised, exposing the metanotum. Abdomen elliptical in the female, the fifth segment about half as long as the preceding;* in the male the sixth abdominal segment as long as the two preceding segments taken together, but narrower, convex, almost tubular when seen from above, unsymmetrical, the end pointing slightly to the right; the seventh segment bears the anal opening on the under side of the sixth; beyond the anus there are two long slender subparallel appendages, arcuate, bidenticulate at the end, nearly as long as the sixth segment, bent under the body when at rest, and embedded in a horny groove on the under side of the sixth segment, which encroaches on the fifth. Legs simple. Marginal cell of the wing open; small cross-vein near the base of discal cell, rectangular; third longitudinal vein gently curved. Type of genus, *E. volucris* O. S.

Eupeodes volucris. (Plate, III figs. 14, 14*a*.)

Eupeodes volucris Osten Sacken, West. Dipt., 329.
Syrphus perpallidus Bigot, Annales Soc. Ent. Fr., 1884, 90.

Habitat.—Washington Territory, California, Nevada, Utah, Kansas, Colorado, New Mexico, Arizona!

♂, ♀. Length, 7 to 10^{mm}. Eyes bare. Face whitish yellow, with black cheeks and a brown or black stripe over the facial tubercle. Frontal triangle whitish yellow with some black pile; front in female black, across the middle a faint subinterrupted arcuate band of whitish pollen leaving a triangular shining space below, lower part of the front yellow, except a dark brown crescent-shaped spot above the root of the antennæ. Antennæ brown or black. Thorax dark metallic green, sometimes slightly bluish, with very pale yellowish pile. Scutellum in male yellowish, more or less translucent metallescent, with pale yellow pile; scutellum in female distinctly yellow along the edge. Abdomen black, subopaque; the first segment, the lateral and posterior margins of all the segments, shining, the fifth wholly shining; on the second segment two yellow oblong spots, well separated from the lateral margin; on each of the two following segments a pair of longer, oblong yellow spots; those on segments three and four very slightly lunate; the posterior margins of the fourth and fifth segments narrowly yellow; sixth segment shining black, sparsely beset with whitish pile. Legs reddish; base of femora black, a little less extensive in the female; hind femora black, except the tip; hind tarsi more or less brown on the upper side. Wings hyaline; stigma yellowish brown.

Fifty specimens. The most common Syrphid on the plains in summer.

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* The female of Syrphus diversipes has the fifth abdominal segment longer than in the other species of the genus.

SYRPHUS.

Syrphus Fabricius, Syst. Entom., 1775.
Scæva Fabricius, Syst. Antl., 1805.
Lasiophticus Rondani, Dipt. Ital., Prodr., i, 51, 1856.
Ancylosyrphus Bigot, Soc. Ent. Fr., 1882, Bull. bimens., No. 6, 78.
Ischyrosyrphus Bigot, Soc. Ent. Fr., 1882, Bull. bimens., No. 6, 78.

Medium to large-sized species, thinly pilose, black, or metallic green or blue, the abdomen with yellow bands or spots. Head hemispherical, as broad or a little broader than the thorax. Antennæ shorter than the head, the third joint oval, as long or scarcely longer than the first two together; arista basal, bare. Face perpendicular, produced but little below the eyes, broad, either wholly yellow or with a black median stripe, often with black cheeks, never[*] wholly black; tubercle obtuse, scarcely at all concave above it in profile, but below always receding. Eyes bare or pubescent, contiguous in the male. Thorax large, moderately convex above, never with distinct yellow lateral stripes. Scutellum more or less translucent, yellow, or yellowish and bluish or greenish. Abdomen oval, broader than the thorax, sometimes with nearly parallel sides and scarcely wider than the thorax, more than twice as long. Legs slender. Third longitudinal vein of the wing nearly straight or gently curved; anterior cross-vein near the base of discal cell; anterior outer angle of the first posterior cell always acute; marginal cell broadly open.

The present genus is one of the most difficult in the family to study. Many of the species are so closely allied that only a large amount of material will determine their limits. Thanks to the careful study which they have received in this country from Baron Osten Sacken, the labor has been much lessened. Still, much remains to be done by local students who shall make large collections and study them thoroughly while they are in a fresh or at least uninjured condition. All but two or three of the species of our fauna now known have been examined by me. Still, I have thought best to reproduce the larger part of Baron Osten Sacken's descriptions, with my own notes or additions appended.

TABLE OF SPECIES.

1.—	Three principal yellow bands of abdomen interrupted	2
	Three principal bands entire	24
	First cross band interrupted; the others entire	12
2.—	Eyes pubescent or pilose	3
	Eyes bare	9
3.—	Abdominal spots crescentric or arcuate, sometimes dissolved into spots . .	4
	Abdominal spots straight and transverse	7
4.—	The abdominal spots do not come in contact with the lateral margin . . .	5
	The abdominal spots reach quite to the margin, or, if not, the spots are but little oblique; emarginate in front, often broken up into smaller spots . . .	6

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[*] *Syrphus simplex* from the West Indies is an exception.

5.—The width of the front in the female nearly equal to half its length . **pauxillus**
The width above distinctly less than half the length (see *lotus*, var.) . . . .
6.—Eastern species . . . . **amalopis**
Western species . . . . **intrudens**
7.—Front in female broad; the abdominal spots, as a rule, do not reach the margin; hind metatarsi of male distinctly swollen; face projecting below . **contumax**
Front in female not unusually broad 8
8.—Third antennal joint scarcely longer than broad; face with an indistinct black stripe; second and third abdominal spots do not reach the lateral margin; the first pair not broader . . . . **sodalis**
Third antennal joint considerably longer than broad; face with a distinct black stripe; abdominal spots narrow . . . . **mentalis**
Third antennal joint oval; first pair of abdominal spots very large; eyes thickly pilose . . . . **velutinus**
9.—Abdominal spots of third and fourth segments distinctly arcuated . **arcuatus**
Abdominal spots straight, transverse 10
10.—Face unusually projecting below, the distance from vertex to antennæ scarcely greater than from thence to tip of tubercle . . . . . . **geniculatus**
Face not unusually projecting below 11
11.—Face with a blackish stripe; all the abdominal spots of nearly equal width **umbellatarum**
Face wholly without a blackish stripe; first pair of abdominal spots small, second and third pairs large, nearly square . . . . **disjectus**
12.—Abdomen narrow, with nearly parallel sides in the male; in the female, the fifth segment half as long as the fourth . . . . **diversipes**
Abdomen distinctly oval; the fifth segment in the female less than half as long as the fourth 13
13.—Femora black at the base 14
Femora yellow at the base 20
14.—The second and third abdominal cross-bands do not reach the lateral margin 15
The second and third bands reach the margin 18
15.—Eyes bare 16
Eyes pubescent; the spots on the second segment separated from the lateral margin; the second and third bands bilaterally oblique . . . . **lotus**
16.—Spots on second segment not reaching the lateral margin; cheeks black, **americanus**
The band or spots on second segment attains the lateral margin 17
17.—Cheeks black . . . . **abbreviatus** ♂
Cheeks yellow . . . . **opinator**
18.—Eyes pubescent . . . . **torvus**
Eyes bare 19
19.—The cross-bands attenuated at their ends . . . . **ribesii**
Cross-bands reach the sides in nearly their full width . . . . . . **Lesueurii**
20.—The second and third abdominal cross-bands attain the lateral margin . . 21
The second and third bands not quite reach the margin 23
21.—The second and third cross-bands attenuated at their tips; face and cheeks yellow, **protritus** ♂, ♀
ribesii ♂
Second and third cross-bands not distinctly narrowed at their ends . . . 22
22.—Face and cheeks wholly yellow; abdominal bands broad . . **xanthostomus**
Face with a median stripe and the cheeks black; abdominal band narrow, **genualis**
23.—Cheeks black; the first pair of abdominal spots narrowly separated from the margin . . . . **americanus**
Cheeks wholly yellow; the first pair of abdominal spots reach quite to the edge **opinator**

24.—Face yellow; the second and third cross-bands distinctly reach the lateral margin **abbreviatus**

Face with a brown stripe; the second and third bands do not reach the lateral margin . . . . **americanus**

For other species, see descriptions. See, also, Appendix.

Syrphus arcuatus.

Scæva arcuata Fallen, Dipt. Suec., 42, 11 (1816); Zetterstedt, Dipt. Scand., ii, 719, and viii, 3138, 22.

Syrphus arcuatus Meigen, Syst. Beschr., iii, 302, 43; Macquart, Hist. Nat. Dipt., i, 536, 6; Walker, Ins. Brit., i, 289, 8; Schiner, Verh. Z. B. Ges., vii, 344; id., Fauna Austr., i, 305.

Scæva lapponica Zetterstedt, Ins. Lapp., 598, 2 (1838).

Syrphus lapponicus Schiner, Ver. Z. B. Ges., vii, 344; Osten Sacken, Proc. Bost. Soc. N. H., xviii, 149; id., West. Dipt., 326; id., Cat. Dipt., 123.

Syrphus agnon Walker, List, etc., iii, 579.

Syrphus arcucinctus Walker, List, etc., iii, 580.

Syrphus Alcidice Walker, List., etc., iii, p. 579; Williston, Proc. Am. Phil. Soc., xx, 312 (*Didea*).

Syrphus arcuatus, var. *bipunctatus* Girschner, Wien. Ent. Zeit., iii, 197, pl. iii, fig. 1.

Habitat.—New England, Wyoming, California, Oregon, Washington Territory, Europe!, Nova Scotia, Hudson's Bay Territory (Walk.).

♂, ♀. Length, 9 to 12^{mm}. Face yellow or bluish-yellow; a median stripe not reaching the antennæ, shining black; cheeks more shining green. Antennæ dark brown, along the under side more or less reddish. Frontal triangle nearly like the face, but with yellowish dust; pile black; a slender black arch above the base of antennæ (sometimes dissolved into two spots), bent downward in its middle portion, and immediately below the color is brighter yellow; front in female black, with black pile, shining, except along the sides, where it is thickly yellowish pollinose, to above the middle, in which place the pollen is narrowly separated. Eyes bare. Thorax deep shining greenish or bluish black, with rather abundant light-colored pile. Scutellum yellowish translucent, with a bluish opalescent reflection, the pile chiefly black. Abdomen black, mostly shining, with three pairs of bright yellow spots, all narrowly separated from the lateral margins; the first pair a little more broadly separated than the others, straight, transverse, elongate oval; second and third pairs a little oblique, concave in front, convex behind, the inner ends rounded, the outer ends acute, directed forwards; fourth segment with a narrow yellow hind margin; fifth with the anterior angles, and the hind border also, yellow. Legs yellowish red; base of front and middle femora, and the hind femora except the tip, black; a ring, or the larger part, of the hind tibiæ, and terminal joints (or, except the base) of all the tarsi brownish. Wings nearly hyaline, subcostal cell brownish, stigma darker.

Variety *arcuatus*. Third longitudinal vein nearly straight, or only gently curved. Four specimens, Connecticut, New Hampshire, Wyoming.

Variety *lapponicus.* Third longitudinal vein deeply curved, the submarginal cell hence much broader in the middle part than beyond. Fifteen specimens, Connecticut, New Hampshire, California, Oregon, Colorado, Virginia.

Variety *lapponicus*, subvar. *bipunctatus* Girschner. This form occurs in America (= *Syrphus Alcidice* Walker). May it not be due to the effects of drying?

The differences, other than in the third vein, are inconstant, and seem to occur equally among specimens from all parts of the country. That this difference alone is a sufficient specific character is to me doubtful; hence I have here considered it a secondary or varietal character, and have for that reason chosen the older name for the species. Schiner considered *S. lapponicus* a synonym of *S. arcuatus.* Of the identity of our species with the European there can be no doubt; specimens sent by Baron Osten Sacken were compared by Dr. Loew.

From the female of *Eupeodes volucris*, which may be easily confounded with *lapponicus*, the difference in the length of the fifth abdominal segment will at once distinguish it.

"*Syrphus arcucinctus* Walker, List, etc. (Hudson's Bay Territory), is represented in the British Museum by two specimens, one of which is my *S. amalopis;* the other belongs to the group of *S. lapponicus.* The description is drawn from the latter specimen, the abdominal spots of *S. amalopis* being much more than 'slightly curved.'"—O. S., Cat. Dipt., 245.

Syrphus amalopis.

Syrphus amalopis Osten Sacken, Proc. Boston Soc. Nat. Hist., xviii, 148, 1875.

Habitat.—White Mountains, New Hampshire (O. S.), Connecticut, New Mexico!

"♂, ♀. 10 to 11mm. "Male. Eyes pubescent; face of a dingy brownish yellow, with a broad brown stripe in the middle (its breadth is equal to half of its length or more); cheeks black, with a greenish reflection; a black, broad, oral border; antennæ black, front and vertex likewise; facial tubercle salient. Thorax dark metallic green, clothed with black pile, mixed with fulvous on the sides and near the scutellum; the latter dull yellowish brown, with metallic reflections, beset with black pile, and with a blackish border and corners. Abdomen black, very little shining; on the second segment two oblong yellow spots; on the third and fourth segments a pair of lunate spots, club-shaped on the inner end, truncate on the outer, and considerably excised in the middle; the fourth and fifth segments with a narrow, yellow, posterior margin; all the yellow parts are straw colored. Legs black, tip of femora and base of tibiæ yellowish brown, the extent of this brown being much less on the hind pair. Wings distinctly infuscated.

Female. Front and vertex metallic greenish black; spots on second segment coarctate in the middle, those on segments three and four dissolved in two, so that these two segments show each a transverse row of yellow spots, nearly of the same size and equidistant; the fifth segment has two spots at the base; the wings are hyaline. In all other respects like the male.

Two males and one female.

I have not the slightest doubt that these males and females belong together; the difference in the coloring of the wings has no importance; as to that in the coloring of the abdomen, I should not wonder if this species proved to be very variable in this respect, and if intermediate stages occurred between that where the lunate spots are entire and where they are dissolved in two. The abdomen in this species is more convex broader and somewhat shorter than that of *S. lapponicus.*

In the specimens described above, the yellow abdominal markings do not come in contact with the lateral margin. But I have a pair of specimens (♂, ♀) from the same locality in which this contact occurs. In the female the spots are also cut in two as they are in the typical specimens."—Osten Sacken, l. c.

I have three female specimens from Connecticut (June 11), on blossoms of *Prunus virginianus*, that seem to be intermediate between this species and the next, *S. intrudens*, but agreeing rather better with the description of *S. intrudens.* The facial stripe is black, narrower than the yellow portion on the sides. The antennæ are wholly reddish yellow; in one specimen only, the third joint is brown; the front has a white pollinose interrupted cross-band; the pile of the scutellum is partly or wholly yellowish. The abdomen is very shining, all the spots attain the lateral margin, those of the third and fourth segments are, in one specimen, only deeply excised, in the other two specimens dissolved into two spots; the spots on the second segment are broadly oval and not at all excised in front. The legs are light yellow; the front and middle femora at the base, and the hind femora on the basal half, are black; the hind tibiæ with a brownish ring, and the hind tarsi in one specimen brownish. A single female from New Mexico (G. F. Gaumer) seems to agree perfectly with the description. The spots on the first segment are excised in front, and those on the third and fourth segments are not cut in two and reach the lateral margin distinctly. The species, as Osten Sacken says, is evidently a variable one, and I am inclined to doubt the validity of *S. intrudens.*

Syrphus intrudens.

Syrphus intrudens Osten Sacken, West. Dipt., 326, 1877.

Habitat,—California (O. S.).

"Length about 10^{mm}. Male. Eyes pubescent; face brownish yellow, with a broad black stripe in the middle, abbreviated before the antennæ, and narrower than the yellow portion of the face on each side of it; the black is prolonged along the oral border to the black cheeks, which have a slight greenish reflection; antennæ black, third joint sometimes slightly reddish at the base; front and vertex black, with a greenish reflection and black pile; occiput beset with a fringe of fulvous pile. Thorax dark metallic green, clothed with fulvous pile, especially conspicuous on the pleuræ; scutellum with a shade of dull yellowish under the strong greenish metallic luster; its pile is black; a few fulvous hairs on the sides only. Abdomen black, very little shining; on the second segment two oblong yellow spots, not reaching the lateral margin; on the third and fourth segments a pair of deeply lunate spots, club shaped at both ends, touching the anterior margin on one side, broadly contiguous to the lateral margin on the other; the deep excision on them has a triangular shape; fourth and fifth segments with a narrow yellow posterior margin. Halteres with a lemon yellow knob. Legs reddish; anterior femora black on their proximal half; hind femora black, except the tip; hind tibiæ with a brown ring in the middle, the other tibiæ also slightly marked with brown; tarsi brownish above. Wings distinctly tinged with brownish; stigma brownish.

Three males, April 15–20.

Very like *Syrphus amalopis* O. S., from the White Mountains, New Hampshire, but the pile on the occiput is bright fulvous, not pale yellowish white; there is more fulvous pile on the thorax; the abdominal spots are a little larger, their inner club-shaped end more clumsy, the emargination deeper; the legs are less dark colored; the facial tubercle less prominent. Nevertheless, the resemblance is very striking. *S. amalopis* seems to be a very variable species. The same variations may occur in *S. intrudens*."—Osten Sacken, l. c.

Syrphus contumax.

Syrphus contumax Osten Sacken, Proc. Bost. Soc. Nat. Hist., xviii, 148, 1875.
Syrphus adolescens Walker, List, etc., iii, 584.

Habitat.—White Mountains, New Hampshire!

"♂, ♀. Length about 9.5^{mm}. Eyes distinctly pubescent. Face with a bluish reflection, sometimes almost concealing the dull brownish yellow ground color. Cheeks and oral border broadly black; front very broad in the female, black, clothed with grayish pollen; in the male with a bluish reflection. Vertex greenish black, metallic. Antennæ black, inserted on brownish yellow ground. Thorax greenish bronze color, with indistinct longitudinal stripes of an opaque brownish; dorsum beset with brownish; pleuræ with brownish fulvous erect pile; scutellum dull yellowish, with a bluish reflection. Abdomen black, very hairy, with three pairs of oblong, transverse, straight, brownish yellow spots, which as a rule do not reach the margin, but sometimes emit an indistinct prolongation anteriorly which touches it; the last two segments are bordered with yellow; the pile on the abdomen, yellow and black, is, especially in the male, long, erect, and rather conspicuous. Femora (of the male) black on their proximal half, often beyond, hind femora up to four-fifths of their length; tibiæ brownish yellow; tarsi black. In the female the femora are black at their bases only; wings hyaline, sometimes tinged with brownish; stigma brownish, third longitudinal vein nearly straight.

Three males and two females from Mount Washington.

The facial tubercle in this species is very salient, the whole lower part of the face somewhat projecting, the front of the female comparatively broad, the first joint of the hind tarsi of the male distinctly swollen. The general appearance of this species is different from an ordinary Syrphus."—Osten Sacken.

"*Syrphus adolescens* is represented in the British Museum by three specimens; one belongs to the group of *S. lapponicus*, the other (from Nova Scotia) is *S. americanus*, the third is my *S. contumax*. The description was probably drawn from the latter, though it is very unmeaning."—O. S., Cat. Dipt., 245.

Syrphus mentalis, n. sp.

Habitat.—Washington Territory!

♀. Length, 9mm. Eyes pubescent. Front shining black, extending down on the sides as far as the insertion of the antennæ, but the latter inserted on yellow ground; across the middle of the front with a rather narrow, interrupted, yellowish pollinose band; pile black. Antennæ brownish black. Face yellow, the cheeks in front, and thence to the middle, along the oral margin, and a moderately broad facial stripe, reaching acutely to the base of the antennæ, black. Cheeks behind, and across behind the mouth, yellow. Thorax shining greenish black, on the pleuræ with whitish pile. Scutellum dark, subtranslucent, only a little yellowish, with black pile. Abdomen broader than the thorax, shining, with three pairs of slender spots; first pair more broadly separated, their outer end attenuated, curving forward to meet the lateral margin; second and third pairs scarcely a fourth the width of the segments, interrupted by about their own width, reaching nearly or quite to the lateral margin; fifth and sixth segments wholly black. Legs dark yellowish red; base of all the femora (on the hind pair including the larger part), and the hind tarsi, black; the hind tibiæ except the base, and the front and middle tarsi, brown. Wings lightly tinged with brown; the stigma brown.

One specimen; an additional one in the Museum of Comparative Zoology at Cambridge.

The front in this species is rather broad above, and the abdominal spots are unusually narrow.

Syrphus disjectus.

Syrphus disjunctus Williston (non Macquart), Proc. Am. Phil. Soc., xx, 314 (1882).

Habitat.—Washington Territory!

♂. Length, 9 to 12mm. Eyes bare. Frontal triangle shining metallic greenish black, narrowly yellow along the eyes, the pile, and that of the vertex also, black. Antennæ brownish black, the first two joints and the base of the third below, reddish. Face yellow, with a bluish reflection, on the sides thinly whitish pilose, no dark spot nor stripe on the tubercle; cheeks below the eyes, in front, black, behind and across the posterior oral margin, yellow. Thorax brownish greenish black, shining, the pile, especially on the sides and on the pleuræ, orange colored. Scutellum only a little yellowish, more bluish opalescent, black at the base and corners; pile in large part black. Abdomen black, but little shining, except on the first segment, the narrow margin of the second and third segments, and the fourth and fifth wholly; with three pairs of bright yellow spots, all very distinctly separated from the lateral margins; the first pair small, oval, broadly separated from each other, near the middle of the segment; second pair large, nearly square, with rounded angles, more than half as wide as the segment, not reaching the front margin, separated by scarcely half their width; the third pair a little smaller, somewhat oblique, and sometimes touching the front margin; fifth segment yellow, with a large triangular black spot. Legs reddish yellow; coxæ, except the trochanters, front and middle femora, hind femora, except narrowly at the base and the outer third or fourth, hind tibiæ, except the base and tip, and the hind tarsi, brown or black. Wings tinged with brownish, the stigma brown.

Four specimens.

The large spots on the third and fourth segments, which are very distinctly separated from each other and the lateral margins, together with the bare eyes, will distinguish this species from any described from North America. A single female from the Boston Society of Natural History (S. Henshaw) is closely allied to this, possibly it is the same. It differs, however, in the spots of the second segment being larger, narrowly separated, those of the third and fourth segments longer transversely and not so wide, and more narrowly separated; the abdomen, except the second segment, is more shining, the dorsum of the thorax more shining greenish, and on the sides thickly yellowish pollinose; the sides of the front are yellow on the lower part. It is probably another species, but more specimens are needed to settle the question.

Syrphus velutinus.

Syrphus velutinus Williston, Proc. Am. Phil. Soc., xx, 314, 1882.
Ischyrosyrphus tricolor Bigot, Annales Soc. Ent. de France, 1884, 73.

Habitat.—Mount Hood, Oregon!, California (Bigot).

♂, ♀. Length, 11 to 12^{mm}. Eyes very distinctly pilose in both sexes. Front shining green-black with black pile. Antennæ black or brownish black. The yellow of the face is obscured somewhat by a metallic bluish reflection, a rather broad black shining stripe in the middle, extending along the oral border to the cheeks, which, with the lower part of the posterior orbits, are greenish black. Dorsum of thorax black, slightly greenish, only a little shining, pile abundant, rather long, light orange colored, or light yellowish, except across the disk, where it is blackish. Scutellum obscure yellowish, translucent, the sides and base broadly bluish black. Abdomen elongate, scarcely broader than the thorax, the sides nearly parallel to the end of the third segment; opaque black; first segment, the hind border of the fourth segment, dilated in the middle, and the fifth segment wholly, shining greenish metallic: second segment with large spots; in the male rounded on the inner ends, and only touching the front border on the outer part, somewhat attenuated before reaching the lateral margin; in the female longer, nearly square, attaining the front border for nearly their whole length; third and fourth segments before their middle with a straight, narrow cross-band, interrupted in the middle for about their own width. Legs black, terminal half of front and middle femora, front and middle tibiæ, except brownish rings beyond the middle, yellow. Wings hyaline, stigma brown.

Syrphus pauxillus, n. sp.

Habitat.—New Mexico!

♀. Length, 7^{mm}. Eyes pilose. Face yellow, a broad median stripe, not reaching the antennæ, and cheeks, shining black; in profile the face is projecting, the distance from antennæ to tip of tubercle distinctly greater than from the antennæ to ocelli. Antennæ black; the third joint brown, on the under side near the base reddish. Dorsum of thorax shining bluish-black, with light yellowish pile. Scutellum only faintly yellowish. Abdomen broadly oval, shining black, with three pairs of yellow spots, which are narrow and rather narrowly separated, all of them narrowly, but distinctly separated from the lateral margin; first pair straight, transverse; the second and third pairs oblique, arcuate, their anterior end nearly touching the front margin the posterior end near the middle of the segment; the spots are concave in front and convex behind, of nearly equal width; fourth segment with a narrow hind margin; fifth segment with a small spot on the front angles, and a narrow margin behind, yellow. Legs yellow, femora black at the base (the hind legs wanting). Wings hyaline, stigma brownish.

One specimen (G. F. Gaumer).

Syrphus sodalis, n. sp.

Habitat.—Colorado!

♀. Length, 10^{mm}. Eyes pilose. Face yellow, lightly pollinose on the sides, a small brownish spot on the tubercle; oral margin and the cheeks metallic black. Antennæ black, third joint reddish below near the base. Front black, broadly grayish pollinose across the middle, leaving the vertex and a small spot below more metallic black; a slender arch, immediately above the antennæ, yellow; pile of front black. Lateral posterior orbits thickly grayish pollinose. Dorsum of thorax deep shining green, with light yellow pile. Scutellum light yellowish, subtranslucent. Abdomen broadly oval, shining black; the cross-bands yellow, interrupted. The first pair of spots is more broadly separated, and have a slender anterior prolongation that reaches quite to the lateral margin; the second and third pairs are less widely separated and the outer ends are distinctly cut off from the lateral margins; the spots are on the front part of the segments, moderately broad, their inner ends nearly touching the front margin of the segments; they are very slightly oblique in position, gently concave in front and convex behind, their outer posterior parts rounded; fifth segment with a narrow hind margin narrowly interrupted, and coalescent on the sides with the yellow of the next segment in front; the fifth segment also with a slender yellow hind border. Legs black; distal half of front and middle femora, tip of hind femora, broad base of all the tibiæ and tips of four front tibiæ, yellow. Wings hyaline; stigma light yellow.

One specimen (H. K. Morrison).

Syrphus lotus, n. sp.

Habitat.—Arizona!

♀. Length, 10mm. Eyes pilose. Face and cheeks yellow, the former, in the single specimen, of a strong green tint; a facial stripe, not reaching the antennæ, brown. Front black, grayish-yellowish dusted across the middle, leaving a large oval spot below, and the vertex, black. Antennæ brown, the third joint below near the base reddish. Pile of front wholly black, of the occiput light yellow. Dorsum of thorax deep green, in front with two grayish pollinose stripes. Scutellum subtranslucent obscure yellow, the pile chiefly black. Abdomen but little shining, black; the bands all distinctly separated by a black interval from the lateral margins; first cross-band interrupted by a small interval; second and third bands bilaterally oblique, cut off squarely at the ends, and touching the front border for a considerable distance in the middle; on each side in front a little concave, on the sides behind nearly straight, or gently convex, the two sides forming a very shallow inverted V; posterior margin of the fourth segment, a spot on the anterior angle of the fifth, and a slender hind margin, yellow. Legs yellow, base of all the femora black. Wings hyaline, stigma brownish.

One specimen, Arizona (H. K. Morrison).

Another female specimen from New Mexico (Geo. F. Gaumer) is perhaps allied to this. The facial stripe is black, and there is a black stripe on the cheeks; the second and third abdominal cross-bands are more oblique, and strongly concave in front, and the second is narrowly interrupted in the middle; they are both more convex behind, and the form more deeply V-shaped. The hind femora are black on nearly their whole length; the hind tibiæ have a black ring, and the hind tarsi, except the base, are also black. From *amalopsis*, with which it may be confounded when the spots are separated, it seems to be distinct in its larger size, more oblique spots (all of which are distinctly separated from the lateral margins), lighter-colored scutellum, etc.

Syrphus diversipes.

Syrphus diversipes Macquart, Dipt. Exot., 4e Suppl., 155, 54; Osten Sacken, Proc. Bost. Soc. Nat. Hist., xviii, 149, 1875.

? *Syrphus cinctellus* Zetterstedt, Dipt. Scand., ii, 742, 45.

Habitat.—White Mountains, New Hampshire, New York, Washington Territory!, Lake Superior (O. S.), New Foundland (Macq.).

♂, ♀. Length, 9mm. "Abdomen narrow, with nearly parallel sides; first segment (♂) greenish black, with more or less yellow anteriorly, or on the sides; in the female the yellow prevails, leaving only a metallic green spot on each side, which often is subobsolete; the following four segments have each a yellow cross-band on their anterior half; the first cross-band is broadly interrupted; in the male the interruption takes the shape of an inverted black triangle, expanding anteriorly so as to occupy nearly the whole anterior margin of the segment; in the female this triangle is narrow, and occupies but a small portion of the anterior margin; thus in the female the yellow of the cross-band coalesces with that upon the first segment; the following cross-bands are entire, the second and third nearly of the same breadth and not attenuated on the sides; the fourth band in the male occupies nearly the whole segment, except a black semicircle posteriorly; in the female it occupies the anterior half of the segment, and is gently arched, and distinctly notched posteriorly. Face yellowish, with a bluish reflection, sometimes brownish in the middle; above the antennæ a conspicuous black spot is surrounded by the yellowish pollen, which covers the rest of the front; antennæ reddish, upper half of the third joint, as well as of the preceding ones brown. Eyes bare. Thorax metallic green; scutellum yellowish, with a metallic green reflection; humeri and a part of the pleuræ clothed with yellowish pollen. Legs yellow; outer half of the hind femora (sometimes nearly the whole hind femora, except the base), hind tibiæ and tarsi brown; knees yellowish. Wings with a brownish shade on the apex, usually distinct in the female, often nearly obsolete in the male.

Ten male and thirty female specimens. Two male specimens have the four anterior femora distinctly infuscated at the base.

S. cinctellus Zetterstedt, is very like this species and probably identical with it. His description agrees with the North American specimens. A European specimen in the Museum of Comparative Zoology, named by Dr. Loew, does not show any difference worth noticing."—Osten Sacken, l. c.

Two male and sixteen female specimens from the White Mountains, New Hampshire (Jackson, July 25), agree fully with this description; a single female from the same locality has, however, the first and second abdominal segments as in the male. A single female from Washington Territory agrees throughout. My female specimens have a peculiarity, not noticed by Baron Osten Sacken, wherein they differ from all the North American Syrphus known to me, viz, the fifth abdominal segment is unusually long, more than half as long as the preceding, agreeing in this respect with *Eupeodes.*

Syrphus protritus.

Syrphus protritus Osten Sacken, West. Dipt., 328.

Habitat.—California (O. S.)

"♂. Length, 10 to 12^{mm}. Eyes glabrous. Face yellow, with a bluish opalescence; on the cheeks a large blackish spot below the eye, and not quite reaching the oral margin (it is variable in size, sometimes very small); the lower edge of the head behind the mouth and between the lower ends of the eyes is again yellow. Antennæ red, sometimes faintly brown on the upper side of the third joint; front brownish yellow above the antennæ, black, slightly pruinose, and with black pile in the corner, between the eyes; vertex black, with black pile; occiput grayish, beset with pale hairs. Thorax dark bronze green, beset with dense yellowish pile. Scutellum yellowish, with black pile, some yellowish hairs on each side. Abdomen black, opaque, with three reddish yellow cross-bands, the first of which is broadly interrupted; the two yellow spots thus formed are prolonged along the lateral margin to the very base of the abdomen; the second and third bands reach the lateral margin, being only a little attenuated before it; they are biconvex posteriorly, with an angular emargination in the middle; fourth segment with a yellow border posteriorly; the fifth red, with a black triangle in the middle. Legs altogether reddish, often a brown shade in the middle of the hind tibiæ and on the hind tarsi, femora red from the very base; coxæ and trochanters black. Wings subhyaline; their root tinged with brownish, the costal cell with yellowish; stigma brownish yellow, third vein nearly straight.

Four males. Is very like the common *S. ribesii* of the Atlantic States; only in that species the male has black hind femora, the black spot on the cheeks is smaller, and the antennæ are much darker."—Osten Sacken, l. c.

Syrphus ribesii.

Musca ribesii Linnè, Fauna Suec., 1816 (1781); Schrank, Enum. Insect. Austr., 905.

Syrphus ribesii Latreille, Gen. Crust., iv, 325; Fabricius, Spec. Insect., ii, 432, 57; Entom. Syst., iv, 304, 100; Meigen, Syst. Beschr., iii, 306, 49; Walker, Ins. Brit., i, 287, 4; Osten Sacken, Cat. Dipt., 123; Schiner, Verh. Z. B. Ges., vii, 340; Fauna Austr., i, 310.

Scæva ribesii Fabricius, Antl., 248, 1; Fallen, Syrph., 40, 6; Zetterstedt, Dipt. Scand., ii, 707; ibid., viii, 3132.

Syrphus rectus Osten Sacken (non Novicki), Proc. Bost. Soc. Nat. Hist., xviii., 140.

? *Syrphus philadelphicus* Macquart, Dipt. Exot., ii, 2, 93, 11; tab., xvi, fig. 2.

Habitat.—Europe, Atlantic, Middle, and Pacific States!

♀, ♂. Length, 7 to 12^{mm}. "♀. Eyes glabrous; hind femora yellow, often with a brown ring before the tip.

♂. Eyes glabrous; hind femora black, except the tip.

Female. Very like the female of *S. torvus;* the differences, as given above, consist in the entirely glabrous eyes and the femora, which are yellow from the very base (coxæ black); in most specimens the hind femora have a brown ring before the tip.

The size, as well as the shape, of the abdominal stripes are very variable (the female of *S. torvus* shows, in both respects, much less variation). Between the following two extremes all intermediate stages occur.

(1) The smallest specimens, from 7^{mm} upwards in length, have the yellow stripes on the third and fourth segments quite straight, not attenuated before coming in contact with the lateral margin; their hind borders show no perceptible convexity or concavity; such specimens usually have a distinct brown ring on the hind femora, a little before the tip.

(2) Larger specimens, up to 11 to 12^{mm} long, have the stripes on the third and fourth segments, with a distinctly biconvex hind margin, with a sinus in the middle; these stripes are distinctly attenuated on each side, before reaching the lateral margin. Such large specimens often have no brown ring on the hind femora.

Male. Differs from the female in the femora being black at base; the four anterior ones for about one-third of their length; the hind ones altogether black or brown, except at the tip. The majority of the specimens before me are of medium size (about 8 to 10^{mm}), but some larger ones also occur. The shape of the yellow bands does not vary as much as in the female; they are always attenuated at both ends and biconvex posteriorly, with a sinus in the middle. The altogether glabrous eyes easily distinguish *S. ribesii* ♂, from *S. torvus* ♂; in other respects they look very much alike. The average size of *S. ribesii* ♂, is a little smaller.

Minor differences between *S. torvus* and *S. ribesii*, available for both sexes, are:

(1) The face under the eyes is altogether yellow here; there is no grayish spot, as is always visible in *S. torvus.*

(2) The sides of the face in *S. torvus* are beset with very distinct blackish pile; in *S. ribesii* this pile is of a pale color, and almost imperceptible; hence the face looks smoother.

(3) The antennæ are less dark, more reddish in *S. ribesii.*

(4) The scutellum is of a slightly purer yellow.

(5) The four anterior tibiæ are less brown, more reddish, especially on the first joint.

(6) The contact of the abdominal yellow spots and bands with the lateral margins is slightly broader in *S. ribesii;* hence the yellow prolongation or neck of the spots on the second segment is broader, and, consequently, seems to be shorter.

(7) The stigma of the wings is much paler, yellow rather than brown.

(8) The metallic green thorax is somewhat more shining, less dull than in *S. torvus;* in many specimens, however, this difference is scarcely perceptible."—Osten Sacken, l. c.

In comparison of a large number of specimens from the East there is little additional worthy of note, except that rarely the tubercle of the face is distinctly brown. From Washington Territory and California I have eight females that do not differ in anything that I can see from the Eastern specimens. The black of the front extends down nearly to the antennæ, the femora are wholly yellow, and the abdominal cross-bands reach quite to the lateral margins of the abdomen, though narrowly so as in our Eastern forms. From *S. opinator*, which is very close, the latter character, and the lower part of the front above the antennæ not being yellow, are the chief differences. It is very possible that these females may belong with the males described by Baron Osten Sacken as *S. protritus*, which differ chiefly from the males of *S. ribesii* in the femora not being black. From Montana and Arizona I have examined a number of specimens, both male and female, which undoubtedly belong to *S. ribesii*. A single small male specimen from Northern California has the cheeks and a broad facial stripe black; the yellow on the sides is also obscure. It may indicate a distinct species.

Syrphus torvus.

Scæva topiaria **Zetterstedt** (non Meigen), Dipt. Lapp., 599; id., Dipt. Scand., ii, 723; ibid., viii, 3139, 26.

Syrphus topiarius Walker, List, etc., iii, 582; Schiner, Verh. Zool. Bot. Ges., vii, 347; Fauna Austr., i, 304; Staeger, Bonsdorf, Malm, etc.

Syrphus torvus Osten Sacken, Proc. Bost. Soc. N. H., xviii, 139 (1875).

Habitat.—Atlantic States, Washington Territory!, Greenland (Staeger), Europe, Siberia (auct.).

♂, ♀. Length, 10 to 12.5^{mm}. "Female. Face and cheeks yellow, with a very slight bluish reflection; a faint grayish spot on the cheeks, under the eyes; oral border; in the middle of the notch, usually slightly brown. Front and vertex greenish black; the former, on both sides along the eyes, with a broad border of yellowish pollen, almost meeting the similar border of the opposite side. Eyes pubescent (in many specimens the pubescence is very much rubbed off and very difficult to perceive). Antennæ inserted on brownish-yellow ground; the dark color of the front begins immediately above their root, forming a blackish-brown arch with a projecting angle in the middle. Antennæ dark brown; third antennal joint more or less reddish below, sometimes altogether dark brown. Thorax greenish, with but little luster; in well-preserved specimens a faint tinge of a geminate, grayish, middle stripe is perceptible anteriorly; scutellum dull yellowish, with a slight bluish reflection and black pile. Yellow spots on the second abdominal segment elliptical, prolonged usually as a narrow neck, which reaches forward and touches the margin; the yellow cross-bands on the third and fourth segments have a very gently biconvex hind margin, with a very shallow, often indistinct, sinus in its middle; on each side the cross-bands are attenuated and curved forward, so as to reach the anterior margin of the segment; the black interval between the stripes is twice as broad as the stripes. Fourth and fifth segments with yellow posterior margins, the fifth usually with two yellow spots on each side, at the base. Coxæ and basal third of femora black; on the hind pair the black reaches beyond the middle of the femora; hind tibiæ often with a brownish ring; four anterior tarsi brown, the root of the first joint often reddish; hind tarsi dark brown. Root of the wings, as far as the humeral cross-vein, slightly brownish, or yellowish; costal cell almost hyaline; stigma brown.

"Male. Similar to the female, but abdominal cross-bands broader, the biconvexity on their hind side stronger, and the sinus in the middle deeper; the gray spot on the cheeks, under the eye, often larger, sometimes occupying a considerable portion of the cheek; the brown ring on the hind tibiæ usually expanded, so as to reach the tip of the tibiæ. The eyes are more distinctly pubescent; the front is beset with yellow pollen, except a narrow black space above the antennæ.

"In drawing up the description, I had a large number of specimens before me. Among them was a lot of twenty-three males and thirty-five females, caught by Mr. B. P. Mann, on the 7th of July, 1874, almost on the same spot, in the subalpine regions of Mount Washington. Another lot of twenty-seven males and twenty females was collected by Mr. Morrison, also in the White Mountains. Other specimens were from Massachusetts, Rhode Island, Canada, the Rocky Mountains in Colorado, etc."—Osten Sacken, l. c.

From an examination of a large series of this species collected in the White Mountains in company with numerous individuals of *S. ribesii* (July 25–30), with others from various localities in the East, the Middle States, Washington Territory, etc., I find nothing worthy of addition to the above full description.

Syrphus Lesueurii. (Plate IV, fig. 2.)

Syrphus Lesueurii Macquart, Dipt. Exot., ii, 2, 92 (female); Osten Sacken, Proc. Bost. Soc. Nat. Hist., xviii, 143.

Epistrophe conjungens Walker, Dipt. Saunders., 242; tab. vi, fig. 5 (male).

Habitat.—New England, Washington Territory!

"♂, ♀. Length, 12 to 13^{mm}. Larger than *S. torvus* and with a much narrower abdomen; in the female the abdomen is a little broader, still less broad than in the allied species. The yellow face has a brown, abbreviated stripe in the middle (sometimes wanting); the antennæ are uniformly black. Eyes bare. The yellow spots and cross-bands on the abdomen are straight, and reach the sides of the abdomen with their full width; the yellow has a bluish reflection (seldom indistinct); in the male the band on the third segment has a sharp triangular notch in the middle of the hind margin, which does not exist in the female; fourth and fifth segments often have a greenish reflection, and are margined with yellow posteriorly. The femora are black at the base, the hind tibiæ have a distinct brown ring. The wings usually have a distinct yellowish tinge.

Some rare specimens of both sexes are only 8^{mm} long.

I compared about ninety male and female specimens, principally from the White Mountains; also from Maine, Massachusetts, New York, etc."—Osten Sacken, l. c.

Baron Osten Sacken could see no difference between *S. lesueurii* and a specimen from Europe labeled "Silesia," which he compared.

Two female specimens from Washington Territory agree in every respect with numerous specimens which I have from Mount Washington. In one the abdominal cross-bands are strongly bluish.

Syrphus abbreviatus.

Scæva abbreviata Zetterstedt, Dipt. Scand., viii, 3136, 13 (female).
Syrphus excisus Schiner, Fauna Austr., i, 311 (in part).
Syrphus abbreviatus Osten Sacken, Proc. Bost. Soc. Nat. Hist., xviii, 144.

Habitat.—Connecticut, Massachusetts!, Europe.

"♂, ♀. Length, about 8^{mm}. Male. Face yellow; cheeks black, which color coalesces with the brown oral borders, and is connected under the oral opening with the black on the opposite side; in some specimens the facial tubercle is also brownish; third antennal joint brownish, more or less reddish on the under side, sometimes altogether reddish; front yellow; no brown spot above the antennæ; vertex blackish-bronze color. Eyes bare. Thoracic dorsum rather bright brassy-green. Yellow spots on second abdominal segment rather large, obliquely triangular, touching the margin with the apex only; the interval between them moderately broad, equal to about one-third or one-fourth of the breadth of the spot; yellow bands on segments three and four rather broad, much broader than the black band between them; the posterior margin in both is sinuate in the middle, more markedly in the band of the third than of the following segments; the bands do not reach the abdominal margin, and are cut off obliquely on the sides; the distance of their anterior corner from the magin is very small, however; fourth segment with a narrow yellow border posteriorly; fifth segment yellow with a small transverse black spot in the middle, near the base. Legs yellow, but base of all the femora black; on the hind femora the black occupies one-third or one-half the femur.

Female. Resembles the male, but with the following differences: lower part of the front above the antennæ, yellow; upper part and vertex brownish green; oral border less infuscated, the infuscation being usually distinct in the middle of the excision only; the yellow spots on the second abdominal segment are larger, the interval between them narrower, often linear, sometimes obsolete; the bands on the third and fourth segments are comparatively narrower than in the male; and but little broader than the interval between them; their hind margins are gently concave-sinuate in the middle, and convex-sinuate each side; both bands distinctly reach the abdominal margin; fifth segment yellow, with a triangular black spot in the middle; coxæ black, but femora altogether yellow (the four anterior femora in some specimens are black at the extreme base only); the hind femora are altogether yellow, thus differing widely from those of the male.

Three male and six female specimens, all from Massachusetts.

A pair (♂, ♀) of European specimens obtained from Dr. Schiner are exactly similar to the American specimens; they also show all the sexual differences, as explained above. Zetterstedt's description agrees very well with my female specimens. In my report on the Diptera of Colorado Territory (U. S. Geol. and Geogr. Surv., etc., by F. V. Hayden, for 1873, p. 564), I mentioned *S. corollæ* as occurring there. I was mistaken in this determination; the specimen is more like *S. abbreviatus*, although I would not without further proof identify it even with this species."—Osten Sacken, l. c.

Four male specimens from Connecticut and Massachusetts agree throughout with the above full description; the second abdominal band in one does, however, distinctly attain the lateral margin of the segment in front. I have a male and a female specimen of *S. corollæ*, received from Mr. F. M. v. d. Wulp, the male of which does not show any difference that I can see from my specimens of *S. abbreviatus*.

Syrphus Americanus.

Syrphus Americanus Wiedemann, Auss. Zw. Ins., ii, 129, 22; Osten Sacken, Proc. Bost. Soc. Nat. Hist., xviii, 145.

Habitat.—New England, Montana!, British Possessions, New York, Delaware, Virginia, Michigan, Texas.

♂, ♀. Length, 9 to 10^{mm}. "Female. Face yellow, often brownish, *with a brown* stripe in the middle, which begins at the oral margin, but does not reach the antennæ; the latter brown, reddish on the underside of the third joint. Cheeks blackish; *but separated from the mouth by a narrow yellow border*, which, on the underside of the mouth completely cuts off the connection between the black color on both sides. Front brownish bronze color, powdered with yellow on each side; the lower part of the front is more or less yellow, but immediately above each antenna there is a brownish spot, which sometimes coalesces with the bronze color of the upper front; vertex bronze color. Eyes bare. The first abdominal cross-band is not interrupted, but coarctate in the middle; its ends do not touch the margin of the abdomen, but are separated from it by a narrow black border; (sometimes a brownish mark in the middle of this band gives it the appearance of being subinterrupted). The second cross-band is nearly as broad as the black cross band between it and the next yellow band; it is usually perfectly straight (in some specimens the hind margin is gently sinuate); its ends do not touch the lateral margin of the abdomen; they are cut obliquely, forming a sharp angle anteriorly, and a rounded one posteriorly; the former almost touches the margin of the abdomen. The third band is similar to the second, only its hind margin is more perceptibly arcuated. The posterior margin of the fourth segment has, as usual, a narrow yellow border; the fifth likewise, and two yellow spots at the base besides.

Femora yellow; the four anterior ones in some specimens brownish at the extreme base only; the hind pair with a more or less distinct brown ring on the distal half; four anterior tibiæ and tarsi yellow; the hind tibiæ sometimes with a brownish ring, the hind tarsi brownish.

Male. Front yellow, with a more or less distinct brown spot above each antenna; cross-bands on the abdomen broader than in the female, and distinctly broader than the black interval between them; posteriorly, they are often nearly straight, sometimes distinctly arcuate, especially the third band. The yellow spots on the second segment are not coalescent, but separated by a narrow black interval (in some specimens subcoalescent); the fifth segment is yellow, with a black spot in the middle. The four anterior femora are black at the base; the hind femora are usually black, with a yellow tip; sometimes there is a trace of yellow at the base; hind tibiæ usually with a brown ring in the middle.

Habitat.—British Possessions, New England, New York, Delaware, Virginia. In Detroit, Mich., in August, I found this to be the most common species. It seems also to be common in Texas. Sixteen males and eight females.

S. americanus, ♀, differs from *S. abbreviatus*, ♀, besides being larger, in the presence of a brown stripe in the face, and of brown spots above the antennæ; in the spots of the second segment being altogether coalescent (instead of narrowly interrupted); in the cross-bands not touching (or hardly touching) the abdominal margin, while in *S. abbreviatus* the contact is broad and distinct; in the cross-bands being (in most specimens) more straight, less sinuate posteriorly.

S. americanus, ♂, differs from *S. abbreviatus*, ♂, besides being larger, by the brown stripe on the face, the more straight second cross-band (less sinuate posteriorly) and by the coloring of the hind femora. In those specimens of *S. americanus* which have the hind femora altogether blackish, the yellow space at the tip is narrower than the yellow space in ordinary specimens of *S. abbreviatus*, ♂. The yellow spots on the second segment (in all my ♂ specimens) do not touch the lateral margin; the black interval, although small, is distinct; in all my ♂ *abbreviatus* these spots distinctly come in contact with the lateral margin. The oral margin is not infuscated here (except, of course, at the point of contact with the facial brown stripe). Attention should also be paid, in both sexes, to the difference in the extent of the black coloring of the cheeks, as described above."—Osten Sacken, l. c.

A number of specimens from New England and four (♂, ♀) from Montana agree throughout with the preceding description. The front above is rather narrower than usual.

Syrphus opinator.

Syrphus opinator Osten Sacken, Western Diptera, 327, 1877.

Habitat.—Washington Territory, California, Oregon!

"♂, ♀. Length, 9 to 11^{mm}. Male. Eyes glabrous; face, including the cheeks, altogether yellow or reddish yellow; no brown stripe on the facial tubercle; antennæ brown, reddish on the under side; front above the antennæ yellow, the angle between the eyes greenish black, yellowish pruinose, beset with black hair; small brown marks above the root of the antennæ. Thorax metallic bluish-green, densely beset with yellow pile; the broad genimate, grayish stripe in the middle is subobsolete. Scutellum yellowish metallic-opalescent, beset with black pile. Abdomen black, opaque on the anterior, subopaque on the posterior part of the segments; the two yellow spots on the second segment are prolonged anteriorly, so as to reach the lateral margin of the segment at its anterior corner; the two other cross-bands are rather narrow (not much broader than one-fourth of the breadth of the segment), attenuated in the middle (even subinterrupted in one of the specimens); their ends are separated from the lateral margin by a narrow black interval; posterior margin of the fourth segment with a narrow reddish border; that of the fifth still narrower. Legs reddish yellow; proximal half (or nearly so) of the four anterior femora black; hind femora black, except at tip; hind tarsi infuscated. Stigma brownish; both costal cells distinctly tinged with brown.

Two specimens.

Female. I have two specimens, which I refer to this species, on account of their entirely yellow face and the course of the cross-bands, which is nearly the same as in the males; but the femora are entirely reddish yellow, coxæ and trochanters remaining black. Vertex greenish black; front metallic green, densely yellowish pollinose, its lower part reddish yellow, except two brownish marks above the root of the antennæ."—Osten Sacken, l. c.

I have examined nearly fifty specimens of this species, male and female, from California, Oregon, and Washington Territory, which agree closely with the above sufficiently full description. The yellow cheeks and face, bare eyes, and the second and third abdominal cross-bands not reaching the lateral margin will distinguish the species.

Syrphus geniculatus. (Plate IV, fig. 3.)

Syrphus geniculatus Macquart, Dipt. Exot., ii, 2, 101, 24; tab., xvii, fig. 5: Osten Sacken, Proc. Bost. Soc. Nat. Hist., 1875, 159.

Habitat.—Newfoundland (Macq.), White Mountains!

♂. Length, 7.5 to 8^{mm}. Eyes bare. Antennæ unusually small for a Syrphus, short, third joint nearly round; black throughout. Face produced downward and forward, the tubercle prominent; dull yellowish on the sides and below the antennæ, but in large part obscured by a greenish-black reflection, the yellowish part clothed with whitish pollen; cheeks and lower part of the face greenish-black, extending up further in the middle, shining on the tubercle. Frontal triangle greenish-black, thickly covered with yellowish dust, and with long black pile; vertex black. Thorax black, or dark brown with a faint, greenish tinge, and with rather abundant black pile. Pleuræ whitish dusted and with light colored pile; scutellum obscurely yellowish, with black pile. Halteres yellow; tegulæ with a brownish border. Abdomen elongate oval, black, opaque, only a little shining; second segment with a very small reddish-yellow spot on the sides before the middle; third and fourth segments with a narrow cross-band near the front, broadly and rectangularly interrupted, touching the lateral margin; narrow hind margins of the fourth and fifth segments and anterior angles of the fifth yellow. Legs dark brown; the tips of the femora and base of the tibiæ only narrowly and obscurely yellowish; the hind legs and all the tarsi black, the hind metatarsi a little thickened. Wings obscurely hyaline, the stigma only a little darker, all the veins blackish.

"Differs from *S. umbellatarum* in being a little smaller (about 7.5^{mm}); the face in profile is much more projecting, the facial tubercle a metallic blackish-green, which color extends on both sides along the oral border; in the other species the facial tubercle bears a distinct stripe; in the female the sides of the face, powdered with yellow pollen, have a brownish-yellow ground color; the antennæ are inserted on black ground; the front in the female is brownish green, much broader than in *S, umbellatarum*; the pollen on the sides is much less thick; it follows on both sides the orbit of the eye to about one-half the distance between the ocelli and the antennæ, and does not reach as much towards the vertex as in the other species; it does not form a well-defined arch; the glabrous space above the antennæ is smaller. The thorax is brownish green (not bluish green); the scutellum has a stronger bluish metallic reflection: the yellow markings on the abdomen are somewhat narrower, and paler yellow; the four anterior legs are of a darker reddish brown, sometimes almost black, with paler knees; when the legs are paler the base of the femora does not appear abruptly tinged with black, as in *S. umbellatarum*."—Osten Sacken.

Syrphus umbellatarum.

? *Syrphus umbellatarum* Schiner, Fauna Austr., i, p. 307.
? *Syrphus guttatus* Walker, List, etc., iii, 586.
Syrphus 6-quadratus Walker, List, etc., 586.
Syrphus umbellatarum Osten Sacken, Proc. Bost. Soc. Nat. Hist., 1875, 151.

Habitat.—White Mountains, New Hampshire, Arizona!

"♂, ♀. Length, 8 to 9^{mm}. Antennæ blackish brown. Thorax shining metallic green; pleuræ thickly whitish pollinose and with whitish pile. Abdomen subopaque black, with three interrupted cross-bands, about one-third of the width of the segments, situated on their anterior parts.

"*Female.*—Eyes glabrous. Face yellow, with a whitish pollen almost concealing the ground color; in the middle a brown stripe, crossing the facial prominence, but abruptly stopping before the base of the antennæ; this stripe does not run down on both sides along the oral margin (it does so for a short distance in a very few specimens); oral margin yellow, as well as the cheeks; front and vertex bluish green (not brownish green); the yellowish-gray pollen on the front forms a well-marked arch, sub-interrupted in the middle, leaving bare on one side the vertex, on the other, a well defined triangle above the antennæ; the sides of this arch run down along the eyes and coalesce with the facial pollen; antennæ inserted on brownish-yellow ground; thorax bluish green; scutellum dull yellow, brown at the extreme ends on each side; it seldom shows any trace of a bluish metallic reflection; the four front legs are reddish yellow, femora black at base; tibiæ with a trace of a brownish ring; tarsi brownish. The abdominal cross-bands usually reach the lateral margins of the segments, but quite often they stop a little distance before, leaving a narrow black border between; their color is reddish or pure yellow, with a more or less distinct whitish pollen, which often gives them a whitish appearance.

Male.—The face often, not always, has a more distinct metallic bluish reflection; the oral border is more often bordered with brown here than in the female; the ground color of the abdomen is more opaque.

I compared twenty-five males and sixty-five females, mostly taken by Mr. Morrison in the White Mountains, New Hampshire."—Osten Sacken, l. c.

Several specimens from the White Mountains agree very well with the foregoing description of Baron Osten Sacken. A single female from Arizona does not show any appreciable difference.

Syrphus xanthostomus, n. sp.

Habitat.—Pennsylvania!

♂. Length, 11 to 12^{mm}. Face and cheeks wholly yellow, antennæ reddish yellow, the third joint somewhat brownish above, but little longer than wide, the arista black. Frontal triangle with a small black spot in the middle, gray pollinose along the eyes, black pilose in the middle. Dorsum of thorax shining metallic green, with light colored pile. Scutellum wholly yellow. Abdomen black, but little shining, the three principal bands very broad, attaining the lateral margins in their full width; first band interrupted, the spots narrowly separated, with their inner ends rounded; second and third bands with a narrow but deep emargination in the middle behind; fifth and sixth segments with a yellow hind margin. The black forms narrower bands than the yellow, and does not quite reach the margin. Legs yellow, the tip of hind tibiæ and their tarsi brownish. Wings hyaline, the stigma yellowish.

♀. Front metallic green, yellow below, on the lower half with yellowish pollen. Yellow spots of the second abdominal segment larger, more nearly square, and only narrowly separated.

Two specimens, Pennsylvania (Mr. Keen).

Syrphus genualis, n. sp.

Habitat.—New Hampshire!

♀. Length, 7.5^{mm}. Front shining black, with an interrupted band of whitish pollen across the middle. Antennæ yellowish red, the third joint brownish above. Face yellow, a median stripe, the oral margin and the cheeks, deep shining black. Dorsum of thorax shining metallic green black, nearly bare. Scutellum wholly light yellow. Abdomen shining black with narrow yellow bands; the first rather narrowly interrupted; the second and third straight, entire, not appreciably narrowed at the margin; fifth and sixth segments with narrow yellow hind margins. Legs yellow; the hind pair, except the base and tip of femora and the base of the tibiæ, brown or blackish. Wings hyaline, subcostal cell light yellow.

One specimen, near the base of Mount Washington, August.

Syrphus simplex.

Syrphus simplex Loew, Wien. Ent. Monatschr., v, 40; Centur, vi, 43.

Habitat.—Cuba (Lw.), San Domingo!

♀. Length 8.5^{mm}. Steel blue, light yellow pilose, antennæ and legs black, base of front and middle tibiæ and the knees of the hind legs lutescent. Basal half of the wings pure hyaline, tip blackish-cinereous.

Head blackish-steel blue, shining. Face white pollinose, the small tubercle bare. Eyes bare. Antennæ black, third joint ovate. Front briefly black pilose on each side, with a marginal white pollinose stripe extending from the middle of the front to the face. Thorax and scutellum steel blue, shining, clothed with whitish pile. Abdomen whitish pubescent, steel blue, each segment on the posterior part obscure, opaque. Venter steel blue, shining. Legs black; base of front and middle tibiæ and the knees of the hind pair lutescent, hind metatarsi subincrassate. Tegulæ whitish. Halteres sordid lutescent. Wings hyaline, the apical half blackish cinereous, stigma blackish fuscous, third longitudinal vein nearly straight.

One specimen, San Domingo (G. F. Frazar).

Syrphus quinquelimbatus.

Syrphus quinquelimbatus Bigot, Ann. Soc. Ent. Fr., 1884, 91.

Habitat.—California (Bigot).

♀, Long. 9 mill. *Antennis nigris, basi, infernè, fulvo notatis; fronte et facie pallidè flavis, parcè fusco tomentosis, vittis medianis nigris pictis, thorace obscurè nitenté, scutello testaceo, flavido tomentosis; calyptris et halteribus palidi testaceis; abdomine nigro, vittis transversis quinque flavidis, primâ interruptâ, quartâ et quintâ angustis, cunctis ad apicem sègmentorum loeatis; pedibus pallidè fulvis, imâ basi, tarsis apice latè, nigris, femoribus posticis latè fusco annulatis, tibiis posticis, tarsis, fuscis; alis hyalinis, maculâ stigmaticali longâ, obscurè testaceâ.*

Antennes et chète noirâtres, 3^{c} segment assez court, ovalaire et teint en dessous, à la base, d'un peu de fauve; front jaunâtre avec une bande mèdiane noire élargie à ses deux extrémités, couvert, ainsi que la face, d'un court duvet clairsemé noirâtre, cette dernière d'un jaunâtre clair avec la bande médiane et les joues brunes; thorax d'un noir peu luisant à villosité jaunâtre ainsi que l'écusson lequel est testacé; cuillerons blancs, bordés de jaunâtre, balanciers testacés; abdomen noir, villosité jaunâtre assez dense, sise de chaque côté de la base, 2^{e} segment avec

deux macules médianes lunulées, allongées, amincies latéralement et atteignant les côtés, 3ᵉ et 4ᵉ avec une large bande basilaire, aténuée latéralement et atteignant aussi les côtés, ce dernier ainsi que le 5ᵉ bordés d'un jaune obscur, tous deux d'un jaune pâle; pieds fauves, hanches, base extrême des cuisses et tarses largement noirs, pieds postérieurs avec un large anneau brunâtre diffus, sur les cuisses, les tibias presque en entier et les tarses d'un brun foncé; ailes hyalines, macule stigmatique allongée, d'un gris jaunâtre. Californie.—1 specim.—Bigot, l. c.

Syrphus maculifrons.

Syrphus maculifrons Bigot, Ann. Soc. Ent. Fr., 1884, 89.

Habitat.—Oregon (Bigot).

Long. 10 *mill.* ♂. *Antennis fulvis, apice nigris, segmento* 3° *ferè orbiculari; frontè fusco tomentosâ; facie flavâ, plus minus rufescente, utriuque pallidiore, ore nigro; thorace œnescente, utriuque obscurè flavido; scutello testaceo, parum metallescente; calyptris pallidè fulvis, halteribus flavis; abdomine nigro, utriuque maculis tribus subquadratis flavis; pedibus fulvis, femoribus posticis obscurè fusco annulatis, tibiis prœter trientem basalem, tarsis plus minus infuscatis; alis obscurè hyalinis.* ♀. *Simillima; fronte nigro nitido latè vittatâ.*

♂. Antennes d'un fauve rougeâtre, dessus et extrémité du 3ᵉ segment noirâtre, ce dernier de forme ovaloïde arrondie, chète rougeâtre; front brun à poils noirs, face d'un jaune plus ou moins rougeâtre, bords de l'ouverture buccale et dessous de la callosité, noirs; thorax d'un bronzé obscur à duvet jaunâtre, latéralement teint d'un jaunâtre obscur; flancs noirâtres avec duvet jaunâtre; écusson jaunâtre avec des reflets bronzés, souvent peu marqués; cuillerons testacés, balanciers jaunes; abdomen d'un noir mat, incisions luisantes, 2ᵉ, 3ᵉ et 4ᵉ segments avec, chacun, une grande macule latérale presque carrée, ayant les angles arrondis, 4ᵉ avec deux macules latérales obliques atteignant les côtés, les derniers segments d'un noir luisant lisérés de fauve; pieds fauves, cuisses postérieures avec un anneau obscur peu distinct, tibias et tarses postérieurs d'un brun plus ou moins foncé, sauf à la base desdits tibias; ailes presque hyalines, macule stigmatique allongée, d'un testacé obscur. ♀. Semblable au mâle, front jaunâtre avec une largé bande médiane d'un noir luisant. Amér. septentr. (Mont Hood).—3♀, 2♀.—Bigot.

ADDITIONAL NORTH AMERICAN SPECIES.

Syrphus agilis Bigot, Annales Soc. Ent., France, 1884, 92.—Mexico.
Syrphus Antiphates Walker, List, etc., iii, 589.—Jamaica.
Syrphus colludens Walker, Trans. Ent. Soc., N. Ser. v, 292.—Mexico.
Syrphus delineatus Macquart, Dipt. Exot., 1er Suppl., 139; pl. xi, fig. 13.—Mexico.
Syrphus eupeltatus Bigot, Annales Soc. Ent. France, 1884, 91.
Syrphus jactator Loew, Wien. Ent. Monatschr., v, 40; Centur., vi, 46.—Cuba.
Syrphus limbatus, Wiedemann, Auss. Zw. Ins., ii, 133, 30.—West Indies.
Scaera limbata Fabricius, Syst. Antl., 251, 10.
Syrphus mutuus Say, J. Acad. Phil., vi, 164, 2; Compl. Wr., ii, 358.—Mexico.

Syrphus nigripes Loew, Centur., vi, 44.—Cuba.
Syrphus praeustus Loew, Centur., vi, 45.—Cuba.
Syrphus quadrifasciatus Bigot, in R. de la Sagra, etc., 804; pl. 20, fig. 5.—Cuba.
Syrphus radiatus Bigot, in R. de la Sagra, etc., 804.—Cuba.
Syrphus stegnus Say, J. Acad. Phil., vi, 163, 1; Compl. Wr., ii, 358.—Mexico.

DIDEA.

Didea Macquart, Hist. Nat. Dipt., i, 508, 1834.
Enica Meigen, Syst. Beschr., vii, 140, 1838.

Large, metallic black, not bare species, with flattened yellow or greenish-yellow banded abdomen. Head hemispherical, broader than the thorax. Antennæ short, third joint oval, with a basal, bare arista. Face gently concave below the antennæ to the obtuse tubercle, thence receding; chiefly yellow. Eyes contiguous in the male, bare or pilose. Thorax without yellow on the dorsum, though it may be pollinose near the sides. Scutellum yellow translucent. Abdomen broadly oval and flattened, broader and much longer than the thorax. All the legs slender. Wings comparatively short and broad; third vein with a considerable sinuosity bending into the first posterior cell; otherwise as in Syrphus. Type of genus, *D. fasciata* Macquart, Europe.

This genus cannot be distinctly separated from Syrphus; as its chief characteristic, the curvature of the third vein, is also found in one of the varieties of *Syrphus arcuatus*. It is, however, useful, and may be retained.

TABLE OF SPECIES.

1.—Third joint of antennæ obtusely pointed at tip; eyes bare; abdominal cross-bands broader toward, but not quite reaching, the lateral margin of the abdomen . . . . **fuscipes**
Third joint of antennæ obtusely rounded at the tip 2
2.—Eyes bare; cross-bands broadly interrupted. (See *Syrphus arcuatus* var. *lapponicus*.)
Eyes thinly pilose; the abdominal cross-bands reach narrowly quite to the lateral margin . . . . **laxa**

Didea fasciata fuscipes.

Didea fuscipes Loew, Centur., iv, 82; Osten Sacken, Cat. Dipt., 245, note 212.

Habitat.—Connecticut, Pennsylvania!

♂, ♀. Length, 11^{mm}. Eyes bare. Antennæ black, the third joint at the base sometimes reddish, elongate oval, obtusely pointed at the tip; arista reddish. Face yellow, with a small, elongate, brownish spot on the tubercle. Front yellow, with two brownish spots above the antennæ, or, in the female, with an inverted V-shaped brown stripe connected with the black of the upper part of the front. Orbits thickly yellowish pollinose, and with a fringe of yellowish-whitish pile. Thorax shining greenish black, on the meso, ptero, and sternopleuræ yellow, thickly covered with similar colored pollen and pile. Scutellum light yellow, translucent. Abdomen black, with four yellow cross-bands, the first consisting of two large ovate spots, narrowly separated and reaching the lateral margins; second and third cross-bands broad, separated from the lateral margins by a black narrow border; they are much narrower in the middle of the segments, the front margin straight, touching the anterior edge of the segments; fourth band similar, but much smaller; posterior margin of the segments shining, dilated in the middle. Legs brown, the posterior tibiæ and all the tarsi blackish; sometimes the legs are luteous, the base of femora, distal portion of tibiæ, and the tarsi brown. Wings grayish hyaline, the base before the humeral cross-vein and the stigma brown, the remainder of the subcostal cell and the costal cell may be brownish; third vein rather deeply curved near the middle of the first posterior cell.

Three specimens, Connecticut, Pennsylvania (S. Auxer, E. Keen).

This species, as it has been called, shows but slight differences from *D. fasciata* of Europe. The propriety of separating them specifically is, to say the least, very doubtful. The only real difference appears to be that the legs are a little lighter colored. In a single specimen that I have from Holland the bands are narrower on the abdomen and the brownish color of the wings fainter; the legs are black, with the base of the tibiæ reddish.

Didea laxa. (Plate IV, figs. 4, 4a.)

Didea laxa Osten Sacken, Bull. Buff. Soc. Nat. Sci., iii, 56; Cat. Dipt., 245, note 212.

Habitat.—New Hampshire, California, Washington Territory, Oregon!, Michigan, Maine (O. S.).

♂, ♀. Length, 10 to 13^{mm}. Eyes pilose, more distinctly so in the male. Antennæ black, third joint oval, obtusely rounded on the end; arista black. Face yellow, with a broad shining black or brown stripe, not reaching the antennæ. Cheeks brown. Frontal triangle black, yellowish dusted along the eyes, pile black; front in female shining black; on the sides the yellowish-gray dust extends up along the eyes and expands in the middle, nearly meeting. Thorax blackish metallic green, shining. Scutellum dull brownish yellow, with a slight greenish or bluish metallic luster. Pleuræ with a whitish vertical stripe. Abdomen black or bluish black, with greenish-yellow cross-bands; on the second segment two large oval spots, reaching (rarely narrowly separated from) the lateral margins; third and fourth segments each with a cross band, extending narrowly quite to the lateral margins, biconvex behind, and with a sharp posterior notch in the middle, in some specimens distinctly interrupted; fourth segment behind narrowly yellow in the middle, forming with the anterior angles of the fifth an entire cross-band; fifth segment behind yellow; pile on the black portions black, elsewhere yellowish. Venter black, the second, third, and fourth segments each with a broad cross-band, narrowed in the middle. Legs yellowish red; proximal half of front and middle femora black, hind femora black, except at tip; hind tibiæ with a brown ring in the middle, sometimes extending over the whole tibiæ; front and middle tarsi brownish, except the base and tip; hind tarsi on the three intermediate joints blackish; the metatarsi also sometimes blackish. Wings with a grayish tinge; stigma brownish; veins on basal part red; curvature of the third vein more shallow than in *D. fuscipes*.

Three specimens from the White Mountains (Dr. George Dimmock, 1506) and thirty-three from Oregon and Washington Territory; also, three from California. In some of the Western specimens the front and middle tibiæ have a small brownish ring.

This species corresponds to *D. alneti* of Europe.

XANTHOGRAMMA.

Xanthogramma Schiner, Wien. Ent. Monatschr., iv, 215, 1860.

Moderately large, nearly bare, species, black, with yellow markings on head, thorax, and abdomen. Antennæ shorter than the head, third joint oval, arista basal, bare. Face yellow, tuberculate. Eyes bare, contiguous in the male; front long in the female, narrowed above. Thorax with yellow lateral stripes. Scutellum yellow, its base black. Abdomen more than twice as long as, and wider than, the thorax; elliptical or with the sides nearly parallel, not club-shaped. Legs simple, slender. Wings as in *Syrphus*, the third vein often gently curved into the first posterior cell. Type of genus *X. ornata* Meigen, Europe.

This genus cannot be sharply distinguished from *Syrphus*, as, except in *aequalis* and *flavipes*, the lateral dorsal stripes are not much more conspicuous than in certain species of *Syrphus*.

TABLE OF SPECIES.

1.—Dorsum of thorax before the scutellum with two coalescent light yellow spots; wings with a brown anterior margin . . . . **aequalis**

Dorsum of thorax without yellow spots on the hind margin; wings not brown in front 2

2.—Pleuræ with light yellow spots . . . . **flavipes**

Pleurae without distinct light yellow spots 3

3.—The yellow band on the second abdominal segment attains the lateral margin. **emarginata**

The yellow band of the second segment is separated by a distinct black interval from the lateral margin 4

4.—All the cross-bands of abdomen broadly interrupted . . . . **divisa**

All the cross-bands not broadly interrupted . . . . **felix**

Xanthogramma felix.

Xanthogramma felix Osten Sacken, Bull. Buff. Soc. Nat. Sci., iii, 67; Cat. Dipt., 126 and 247, note 215; Williston, Proc. Phil. Soc., xx, 311.

Habitat.—Illinois, New York (O. S.), Connecticut!

"♀. Length 9.5 to 10.5$^{\text{mm}}$. Face and cheeks yellow (in all my specimens, except one, the face has the brownish-red tinge, which the faces of Syrphus sometimes assume); vertex dark metallic green, emitting a stripe of the same color, which reaches the base of the antennæ, where it expands a little; between this stripe and the eyes the front is yellow. Antennæ black, sometimes faintly reddish on the under side, near the suture of the second and third joints; third joint rather large, oval, blunt. Thoracic dorsum of a rather bright metallic green; on each side a yellow stripe runs from the humerus to the callosity near the scutel; the latter yellow, the extreme base and corners blackish, or brown. Pleurae with a large, ill-defined yellow spot below the wings. First abdominal segment with a yellow spot each side (just under the halteres); the first cross-band, (on the second segment), is either interrupted by a very narrow black line in the middle, or entire; the second band is coarctate in the middle, its hind margin being a shallow obtuse angle; the same may be said of the third band, except that the obtuse angle is deeper, and often has a notch in the middle, which sometimes cuts the band in two; there is a narrow fourth band at the base of the fifth segment, encroaching upon the hind margin of the preceding segment; the fifth segment has a narrow yellow posterior margin. Legs yellow, hindlegs black or brown, except the base of the femora, and a space on both sides of the knees. Wings with a distinct brownish tinge on the distal half, anteriorly; stigma brownish; sometimes the whole wing has a brownish yellow tinge.

"Habitat, West Point, N. Y., in September 8–10, three females; Illinois; Pennsylvania. (The specimen from the latter locality is smaller, wings more hyaline, legs and antennæ of a paler color). The first and third bands are as often interrupted as not; the second often shows a vestige of an interruption in the shape of an indistinct blackish line in the middle."—Osten Sacken, l. c.

A single female specimen from Connecticut (Dr. L. T. Day) agrees very well with the foregoing description, except that the third joint of the antennæ is black above and at the tip, and the other joints are reddish. The first and third cross-bands of the abdomen are narrowly interrupted, the second entire, but emarginate behind.

Xanthogramma divisa.

Xanthogramma divisa Williston, Proc. Am. Phil. Soc., xx, 311.

Habitat.—Washington Territory, White Mountains!

♀. Length 9 to 11^{mm}. Face and cheeks yellow, or reddish-yellow. Face nearly perpendicular, gently concave below the antennæ, and with a large obtuse tubercle below. Front above metallic greenish-black, continued as a broad stripe to the base of the antennæ, somewhat expanded below; on the sides yellow. Antennæ black; somewhat reddish below on the sides of the second, and of the third joint near the base. Dorsum of thorax deep metallic green, with rather ill-defined yellow lateral stripes. Pleuræ with a large ill-defined spot. Scutellum a somewhat translucent yellow, its base narrowly black. Abdomen:

first segment with a small yellow spot on each side, just under the halteres; second segment with an oval spot on each side, not reaching the lateral margin, somewhat attenuated toward the inner end; third and fourth with large rectangular spots separated by nearly their own width, and not quite reaching the lateral margin; fifth with an anterior fascia, narrower in the middle, and encroaching slightly upon the preceding segment. Legs yellow, anterior and middle femora sometimes narrowly brown annulate near the base; posterior legs mostly brownish or blackish, except the base of femora, and broadly on the knees. Wings hyaline with a slight smoky tinge; stigma yellowish.

Eight specimens, Washington Territory, and a single female from the White Mountains, New Hampshire, July 25.

This species is very closely related to *X. felix*, and I am not at all sure but that it may be the same. The broadly interrupted bands of the abdomen, however, seem to indicate a specific difference. The abdomen in all my specimens is broadest at the tip of the third segment; in my single specimen of *X. felix* it attains its full width at the end of the second.

Xanthogramma emarginata.

Scæva emarginata Say, J. Acad. Phil., iii, 91, 5; Compl. Wr., ii, 79.
Syrphus emarginatus Wiedemann, Auss. Zw. Ins., ii, 119,4.
? *Allograpta emarginata* Osten Sacken, Cat. Dipt., 126. (The query is Osten Sacken's.)

Habitat.—Florida, Pennsylvania, New Hampshire!

♂, ♀. Length, 10 to 11^{mm}. Face wholly yellow (or reddish-yellow). Antennæ reddish; the third joint near the base and on upper part blackish. Frontal triangle, just above the antennæ, with two blackish spots, connected by a brownish arcuated band; elsewhere the triangle is yellowish pollinose. Front in female shining metallic green: on the sides, from a little below the ocelli, yellow like the face, and yellow pollinose; pile black. Thorax shining bronze-green, with a rather broad, not conspicuous yellow stripe on each side; an ill defined yellow spot on the pleuræ. Scutellum translucent yellow, with black and yellow pile. Abdomen opaque black; first segment shining, yellow on the sides, near the halteres; second segment with the extreme front angles yellow, and two large, oval spots, narrowly separated, and only a little attenuated before the lateral margins, which they touch; third segment narrowly yellow at the anterior angles, and near the middle with a broad yellow cross-band, not attenuated at the sides, separated from the lateral margins, or the anterior angles only, nearly touching, behind in the middle with a broad, angular emargination, reaching about half way through the band; posterior edge of the third segment also narrowly yellow, but not reaching the sides, forming with the yellow margin of the next segment a narrow, gently arcuate band; fourth segment with a similar median cross-band, but the posterior emargination deeper, and more acute, nearly cutting the band in two (in some specimens distinctly interrupted), the posterior margin of the segment is more broadly yellow; fifth segment with a triangular basal spot on each side, and the posterior margin yellow. Legs yellow; the hind femora and tibiæ with a rather broad ring, and the hind tarsi brown. Wings hyaline; stigma light yellowish.

A single specimen, from Professor Riley's collection, labelled "269, found under bark of cotton tree, Fla. Apr. 20, '74." Another specimen was received from Mr. Eugene Keen, of Philadelphia, collected in Pennsylvania; also three males and one female, collected by myself, near the base of Mt. Washington, near evening, July 25.

In a specimen from the White Mountains, examined since the above was written, I find the spots of the second segment distinctly separated from the lateral margin. It might readily be confounded with specimens of *X. felix*, but the species offers other distinct differences. In *X. emarginata* the last section of the fourth vein is longer and more oblique; the first posterior cell broader; the first pair of abdominal spots are more broadly separated, and the two following bands more rounded on their posterior angles; the black of the abdomen is less shining, the dorsum of the thorax more metallic than in the two specimens of *X. felix* known to me.

Xanthogramma flavipes.

Doros flavipes Loew, Centur., iv, 83.

Habitat.—Pennsylvania, Connecticut!, New York (O. S.)

♂, ♀. Length, 7 to 10^{mm}. Head pure light sulphur-yellow; in the female the front much narrowed above, with a slender black stripe reaching from the black vertex to the base of the antennæ. First joint of antennæ yellow; second joint yellowish reddish; third joint blackish, reddish toward the base below, rounded, larger in the female. In the male an inverted V-shaped ridge above the antennæ, with a small black dot in the apex. Face considerably receding, with a prominent tubercle below the middle; pile yellow, on the posterior orbits white. Thorax shining greenish black, the lateral stripes entire, bright yellow, sharply distinguished; on the pleuræ, a middle stripe, reaching on the sterno-pleura, a spot above the anterior coxæ, and the sides of the metanotum, yellow. Scutellum light yellow along its margin, black at the base. Abdomen velvety black. In the male the first segment shining; second segment with a broadly interrupted yellow fascia near the front part; third segment with the broadest fascia entire, on the front part, emarginate behind; fourth segment similar, and also on the hind border narrowly yellow, not reaching the sides, but forming with the anterior angles of the fifth segment a strongly arcuated band, the latter segment yellow behind; hypopygium blackish; third segment across the middle with a narrow shining fascia, which in some specimens may be reddish; fourth segment with a broader shining cross-band; fifth wholly so. In the female the first three cross-bands are narrower than in the male, of an even width, not interrupted nor emarginate, the shining fasciæ across the second, third, and fourth segments are broader and sometimes quite reddish or yellowish in the middle; pile yellow on the yellow portions, black elsewhere. Legs yellow; the hind tarsi reddish or blackish, except the last two joints. Wings hyaline; the stigma yellowish.

Six specimens from Connecticut. This species is found usually in thick, shady vegetation, in damp places.

Xanthogramma æqualis. (Plate IV, fig. 6.)

Doros æqualis Loew, Centur., iv, 84.

Habitat.—Pennsylvania (Lw.), District of Columbia!

♀. Length, 8mm. Face bright yellow, a brown spot on the cheeks, and a small faint one on the tubercle. Antennæ black, the basal joints and base of the third joint reddish. Front rather narrow above; yellow, black at the vertex, continued as a rather narrow black stripe to the base of the antennæ. Thorax black, nearly bare; near the middle of the dorsum with two faint pollinose stripes; on the lateral margin with a narrow, well-defined, bright-yellow stripe; on the posterior margin, with a rather small transverse yellow spot, cut in two, or nearly so, by a rectangular black emargination in front. Pleuræ with two oval, bright yellow spots, one on the sterno-pleuræ and one above the front coxæ. Scutellum reddish, blackish at the base, along its border with a row of short, light-colored hairs. Abdomen cylindrical in front, compressed behind, shining black, with rather narrow bright-yellow bands, as follows: An arcuate band near the middle of the second segment; a straight one at the base of the third segment; one at the base and one at the posterior margin of the fourth segment, the posterior one dilated in the middle; on the posterior margin of the third segment there is a small median yellow spot, and on the fifth segment there is a slender longitudinal stripe, not quite reaching the anterior margin. Venter with four yellow cross bands, the first three rather broad, and situated upon the posterior margin of the preceding and anterior margin of the following segments; the fourth band is linear, and situated upon the hind margin of the fourth segment. Legs yellow; the femora broadly, in the middle (especially the hind pair), the tip of the hind tibiæ, and the hind tarsi, reddish or brownish. Wings nearly hyaline, along the front border rather narrowly and equally brown.

♂. Length, 9.5mm. Head yellow, vertical triangle and occiput black, the latter white pollinose on the margin. Frontal lunule, antennæ, and cheeks blackish pitchy. Thorax black, clothed with lutescent and whitish blackish pile; dorsum on each side with a yellow stripe, and on the [posterior] margin with two confluent spots; besides these, with two, more obsolete, whitish pollinose stripes. Pleuræ yellow bimaculate. Scutellum testaceous. Abdomen of equal width, black, shining, with three narrow yellow fasciæ; the first moderately arcuate, in the middle of the second segment; second and third straight, at the base of the segments, both narrowly interrupted; basal fascia of fifth segment concealed; posterior margins of third and fourth segments yellow, fifth segment with a yellow triangle. Venter black, with three narrow fasciæ, and the hind margin of the fifth segment yellow. Anterior femora fuscous, on their posterior sides fuscous black, on the apical third yellow; hind femora fuscous black, base luteous, tip yellow; tibiæ yellow, distal half of the hind ones fuscous ochraceous; anterior tarsi luteous, hind ones ochraceous fuscous. Wings very dilutely subinfuscate, costa broadly and of equal width, clouded with fuscous.—Translation from Loew., l. c.

A single female from Virginia, for which I am indebted to the kindness of Mr. Theo. Pergande, belongs, I believe, to this species, notwithstanding the differences from Loew's description in the markings of the abdomen and legs. It is a very striking species, and may perhaps be a true *Doros*.

An examination of the type specimen assures me that the male and female here described belong together.

ALLOGRAPTA.

Allograpta Osten Sacken, Bull. Buff. Soc. Nat. Sci. iii, 49, 1876.

Elongate, small, bare species, thorax with yellow lateral stripes, the abdomen with yellow bands, and on the fourth and fifth segments with two slender median stripes and oblique side spot. Eyes in the male with an area of distinctly enlarged facets on upper part. Ocelli as in *Syrphus*. Thorax without median cinereous dorsal stripe. In this latter and in other respects as in *Syrphus*. Type of genus, *A. obliqua* Say.

TABLE OF SPECIES.

Face wholly yellow, or in the middle only faintly brownish . . . . . **obliqua.**
"Face with a bluish black stripe, extending from the oral margin to the antennæ." **fracta.**

Allograpta obliqua.

Scaeva obliqua Say, J. Acad. Phil. iii, 89, 2; Compl. Wr. ii, 78.
Syrphus obliquus Say, Amer. Ent., pl. xi; Compl. Wr. i, 23; Wiedemann, Auss. Zw. Ins., ii, 138, 39 (translation from Say); Schiner, Novara Exped., 353, 43.
Syrphus securiferus Macquart, Dipt. Exot., ii, 2, 100, 22; id., ibid., 1er Suppl., 130 (female). (Type compared by Osten Sacken.)
Sphærophoria Bacchides Walker, List, etc. 594. (Type compared by Osten Sacken.)
Syrphus dimensus Walker, Dipt. Saunders., 235. (Type compared by Osten Sacken.)
Syrphus signatus v. d. Wulp, Tijds. v. Ent., x, 144, 15; pl. iv, fig. 12.
Allograpta obliqua Osten Sacken, Bull. Buff. Soc. Nat. Sci., iii, 49; Cat. Dipt., 126 and note 214; v. d. Wulp, Tijds. v. Ent., xxvi, 1, 33; pl. i, fig. 1.

Habitat.—Atlantic and Pacific States! Argentine Republic (v. d. Wulp).

♂, ♀. Length, 6 to 7^{mm}. Face yellow, often with a bluish reflection, slightly brownish on the tubercle. Frontal triangle yellow; front in the female shining black on the vertex, continued as a broad stripe (broadest below) to the antennæ; on the sides the yellow of the face continues up along the eyes nearly to the ocelli. Antennæ reddish-brown, blackish on the upper part of the third joint. Thorax deep shining green, on the sides with a yellow stripe, reaching from the humeri to the suture, where it is sharply truncate; post-alar callosity also yellow. Scutellum wholly light yellow, faintly reddish on the disk; pile black. Abdomen black, or brown; first segment, except a slender transverse spot on each side behind, yellow; second segment with a slender yellow anterior fascia, and a broader one in the middle, about a third of the width of the segment, straight and but slightly widened at the sides; third segment with a broad arcuate band, not quite touching the posterior angles on the sides; fourth segment with two slender parallel stripes, leaving a slender black stripe between them, on each side a broader, oblique, oval spot, touching, or narrowly separated from the anterior end of the yellow longitudinal stripe, and reaching to the posterior angles; fifth segment similar, but the side spots less oblique. Legs light yellow; last three joints of all the tarsi, the hind tibiæ, except the base and a middle ring, and a ring on outer part of hind femora, brownish. Wings hyaline, veins black.

A widely spread and common species. I have it from Connecticut, New Hampshire, Kentucky, Colorado, California, and Washington Territory. Schiner and v. d. Wulp record it from South America.

Allograpta fracta.

Allograpta fracta Osten Sacken, West. Dipt., 331.

Habitat.—California (O. S.)!

"♂. Length, 7mm. Face, including the frontal triangle, pale yellow, slightly opalescent; a bluish-black stripe extends from the oral edge to the antennæ, forming a semicircle above them. Antennæ reddish, third segment brown along the upper edge, vertex black. Thorax bright metallic green, a pale yellow stripe on each side between the humerus and the root of the wings; ante-scutellar [post-alar] callosity yellowish; scutellum of a saturate yellow, the extreme corners dark; halteres with yellow knobs. First abdominal segment metallic greenish black, its extreme anterior margin only yellow; the rest of the abdomen black, opaque; an interrupted yellow cross-band on the second segment equal to about one-third the segment in breadth; a somewhat broader, slightly arched, and not interrupted yellow cross-band on the third segment; on the fourth, two narrow, parallel, longitudinal lines in the middle, and an obliquely-placed, large, oval spot on each side of them, yellow; the narrow fifth segment shows a yellow picture, somewhat resembling that of the fourth segment. Legs yellow; tip of tarsi brownish; hind femora with a brown ring before the tip; hind tibiæ with two such rings, one before the middle, the other before the tip; hind tarsi brown, except the under side of the first joint. Wings hyaline; stigma brownish yellow.

"*Habitat.*—Santa Monica, California, February 20, 1876. A single male."

The chief differences that this description shows from *A. obliqua* are in the black stripe on the face, and the first abdominal segment being black.

MESOGRAPTA.

Toxomerus Macquart, Dipt. Exot., 5e Suppl., 92, 1855.
Mesogramma Loew, Centur., vi, 47, 1865.
Mesograpta Loew, Centur., vol. ii, p. 290, 1872.

Small, somewhat elongate species, thinly pilose, shining black, with yellow markings on head, thorax, and abdomen. Head hemispherical, face small, short, prominent in the middle. Antennæ situated near the middle of the head in profile, short, third joint oval, arista basal, bare. Eyes narrowly contiguous in the male, midway between the antennæ and ocelli; vertical triangle long, acute; front in female longer than the face, narrowed toward the vertex. Ocelli in both sexes remote from the vertex. Dorsum of thorax with a median cinereous linear stripe and lateral yellow margins. Scutellum black, with yellow border. Legs rather slender; hind femora in the male sometimes thickened and arcuate. Wings as in Syrphus. Type of genus, *M. parvula* Loew, North America.

The species are very variable in the coloring of the abdomen, and caution should be used in founding new species on such differences. Indeed here, as elsewhere in this family, specific characters are usually more or less doubtful when not based upon some structural differences.

TABLE OF SPECIES.

1.—Hind femora in male thickened and arcuate, the tibiæ dilated at tip . **geminata**
Hind femora in male simple 2
2.—Scutellum yellow; legs yellow, except the hind tarsi 3
Scutellum black with a yellow margin; front of female much narrowed above: hind femora in part black . . . . **parvula, Boscii**
Scutellum black or brown with a yellow border; front of female above only a little narrowed; hind femora wholly yellow . . . . . **marginata, var.**
3.—Front of female only a little narrowed above; third-fifth abdominal segments with narrow lateral yellow margins . . . . **marginata**
Front of female much narrowed above; third-fifth abdominal segments not yellow on the margins . . . . **polita**

For other species, see descriptions, and also appendix.

Mesograpta polita.

Scæva polita Say, J. Acad. Phil., iii, 68; Compl. Wr., ii, 77.
Syrphus politus Say, Amer. Entom., i, pl. xi, fig. 3; Wiedemann, Auss. Zw. Ins., ii, 132, 28.
Syrphus cingulatulus Macquart, Dipt. Exot., 4e Suppl., 155, 53. (Type compared by Osten Sacken.)
Syrphus hecticus Jaennicke, Neue Exot. Dipt., 90.

Habitat.—North Carolina, Kansas, Connecticut, Georgia!, Cuba, (O. S.).

♂, ♀. Length, 8 to 9^{mm}. Face yellow, with whitish dust on the sides, antennæ a little more reddish yellow, narrowly brownish or blackish above. Frontal triangle yellow; vertical triangle black, pollinose in front of the ocelli. Front in female black, rather thickly yellowish-whitish pollinose; on the sides below the ocelli narrowly yellow. Occiput grayish-yellowish pollinose, silvery on the sides. Median cinereous stripe of thorax very distinct; on the upper border of the yellow lateral stripe indistinctly glaucous green; between these and the middle stripe the color is brownish or olivaceous, indistinctly divided by a cinereous line, the beginning of which in front is dilated and very distinct. Pleuræ shining metallic, with three yellow spots, viz., one on the meso, one on the sterno-pleuræ, and one above the front coxæ, smaller than the others. Scutellum wholly yellow, somewhat reddish on the disk. Abdomen shining black; first segment yellow at the base and sides; second segment with a broad median entire yellow cross-band; third and fourth in the female with a narrow yellow anterior border, and a slender median line, passing through the rather narrow interruptions of the rather broad median yellow cross-bands; fifth segment yellow, except two rectangular, parallel, more or less confluent black spots. In the male the third and fourth segments are yellow or yellowish red, except a pair of black lines on each side, like the three sides of a square, more or less indistinct; fifth segment and the hypopygium wholly yellow. Legs bright yellow; hind tarsi reddish, the terminal joints blackish. Wings nearly hyaline, the stigma dilutely yellow.

Thirty specimens.

Mesograpta parvula.

Mesogramma parvula Loew, Centur., vi., 47.
Mesograpta parvula Osten Sacken, Cat. Dipt., 125.

Habitat.—Georgia!, Florida (Lw.).

♂, ♀. Length, 5 to 6^{mm}. Black, somewhat metallic. Face yellow, silvery pollinose on the sides. Antennæ yellowish, somewhat infuscated. Front in female very narrow above, shining greenish black, bronzed at vertex, yellow on the sides below the vertex. Cheeks black; lateral posterior orbits silvery. Median dorsal cinereous stripe only moderately distinct, on either side of which, and more outwardly, separated by a more shining stripe, a second, more olivaceous, less shining one. Pleuræ shining bluish black with a yellow spot on the mesopluræ, and a more whitish one below; no spot above the front coxæ. Scutellum black, with a yellow margin. Abdomen black; opaque, except the first segment, an anterior and posterior band on the second, and a posterior band on the following segments, shining; yellow markings as follows: base of the first segment, sometimes a slender band on the second, entire or interrupted, a broader anterior band on the third and fourth segments, interrupted, and produced into a process posteriorly at the inner ends; in the interrupted spaces a slender longitudinal stripe; on the fifth segment a broadly interrupted fascia, in the male more slender than in the female, sometimes yellow with three large oval longitudinal spots. Legs yellow; hind femora with a rather broad, preapical, black ring; the hind tibiæ, except the base and tip, black; hind tarsi more or less reddish, blackish toward the tip. Wings nearly hyaline, stigma subfuscous.

One male and two female specimens from Georgia. The males have the abdomen obscurely brownish reddish beyond the second segment, with narrow indistinct blackish markings. From *M. geminata*, which it closely resembles, it may be distinguished by the hind femora, which are perfectly straight, and somewhat compressed, not curved and cylindrical; the fifth abdominal segment is, in the female, in *M. parvula* much longer proportionally than in *M. geminata.*

Mesograpta marginata.

Scaeva marginata Say, J. Acad. Phil., ii, 92, 6; Compl. Wr., ii, 80.
Syrphus marginatus Wiedemann, Auss. Zw. Ins., ii, 146, 52.
Mesogramma planiventris Loew, Centur., vi, 49.
Syrphus Quintius Walker, Dipt. Saunders., 239.
Mesograpta marginata Osten Sacken, Cat. Dipt., 125.

Habitat.—Atlantic, Southern, Middle, and Pacific States!

♀. Length, 5 to 6mm. Face whitish yellow, thinly pollinose, cheeks black. Antennae reddish yellow, a little fuscous above; arista black. Front only moderately narrowed above, greenish black, shining at the vertex, lightly yellowish pollinose below; on the sides below the ocelli narrowly yellow like the face; posterior orbits yellowish pollinose, in some reflections silvery. Dorsum of thorax olivaceous black, but little shining, median cinereous stripe distinct, bordered narrowly on each side with brownish; pleuræ shining greenish black; beside the yellow spots on the meso and sterno pleuræ, there is a third, minute one, above the front coxæ. Scutellum yellow, with black pile. Abdomen black, shining, narrowly margined with yellow; oval, flattened; first segment at the base, second segment with a median cross-band, third and fourth segments each with a median line and a somewhat oblique large spot on each side attaining the base of the segment, fifth segment with two oblique spots confluent at the tip, yellow. Legs yellow, the hind tarsi a little brownish, blackish at the tip. Wings nearly hyaline.

This description applies to twenty specimens from New York and Connecticut, which agree quite with Say's description, and hence may be considered as the typical *marginata.* This species is variable, scarcely any two specimens being precisely alike in the abdominal markings, which makes it seem strange that Loew should base a species upon such characters. The head in the male differs only in the frontal triangle being yellow and the vertical triangle black. Of the different variations in the abdomen the following are such as my specimens show:

Ten specimens from Colorado, all males, are rather smaller than the Eastern specimens and have the scutellum wholly yellow, except a faint reddish color on the disk, the yellow band of the second abdominal segment rather broad, and the third and following segments wholly obscurely reddish yellow, except a small circular black spot on the middle of the fifth segment; on two of these are small obscure blackish marks on the third and fourth segments. Three more males from Colorado and four from Western Kansas have the black longitudinal and transverse spots very distinct, so that in most of them the yellow is confined to oblique spots nearly as in the typical form. A single female from Colorado, another from Montana, and several from Western Kansas, have the oblique spots of the third and fourth segments coalescent, leaving only two minute spots in the middle near the front, and on the fifth segment there are a circular median spot and two oblique lateral elongated ones; others, females, have the yellow spots distinct, as in the typical form.

In several female specimens from Georgia and Florida the abdomen is chiefly black, the first segment nearly wholly so, the second either wholly black or with two small yellow spots, and the yellow triangles of the following segments small and slender; in some the scutellum is distinctly darker above, in one almost blackish on the disk; the specimen from Montana, however, shows the same blackish color, and here the yellow spots of the abdomen are confluent. A dozen other specimens from Georgia and Florida present no essential differences from the Western and Northern ones. Specimens from the White Mountains are precisely similar to the first-mentioned males from Colorado, and, hence, it is probable that such specimens will usually be found in high altitudes or latitudes. Specimens from Connecticut agree with all the variations previously mentioned; others from Washington Territory and California offer no peculiarities.

I have no doubt from the study of the material here described that *planiventris* is purely a synonym of *marginata*. The only point in which it appears to differ from the typical varieties is in the greater amount of yellow on the abdomen,—the black on the third and fourth segments confined to two median spots and a posterior interrupted transverse band dilated at the angles, and the fifth segment with only a single spot. Such specimens occur in Connecticut and Colorado, as well as Florida, whence the species was described.

One female specimen from Connecticut and two from California, although otherwise not differing from the more typical form, have the scutellum a deep shining black, narrowly edged with yellow. There are so many intermediate forms that this character, though a striking one, is not of specific value.

Two male specimens from Florida (Professor Riley) have the abdomen wholly reddish yellow, except two small spots on the first segment. I am not sure that they belong to this species.

Mesograpta geminata. (Plate IV, figs. 5, 5*a*.)

Soaeva geminata Say, J. Acad. Phil., iii, 92, 7; Compl. Wr., ii, 80.
Syrphus geminatus Wiedemann, Auss. Zw. Ins., ii, 145, 50.
Syrphus interrogans Walker, Dipt. Saund., 238.
Eumerus privernus Walker, l. c. 225.
Toxomerus notatus Macquart, Dipt. Exot. 5^e Suppl., 93, pl. v, fig. 4.
Mesogramma geminata Schiner, Novara Exped., 347, note.
Mesograpta geminata O. Sacken, Bull. Buff. Soc. N. Sci.; Cat. Dipt., 125.
Toxomerus geminatus Williston, Proc. Am. Phil. Soc., xx, 310.

Habitat.—Atlantic and Pacific States!, South America (Schiner).

♂, ♀. Length, 5 to 6^{mm}. Face, frontal triangle, and antennæ, light yellow, the face with white pollen on the sides, the antennæ sometimes a little brownish. Front in female much narrowed above, shining black, narrowly yellow on the sides on the lower half. Posterior orbits thickly whitish dusted. Dorsum of thorax shining black, with opaque linear stripes, the lateral stripes entire, the median cinereous stripe only moderately distinct. Pleuræ shining greenish black; an oval yellow spot on the meso-pleuræ, and a smaller more whitish one below it, narrowly separated. Scutellum with an entire yellow margin. Abdomen broadest at the tip of the third segment; broadly flattened oval in the female; shining black, variable, usually with yellow markings as follows: first segment at the base; second segment with a narrow median cross-band, attenuated in the middle and interrupted; third and fourth segments with a slender median stripe, broader toward the front, and a pair of large spots on the anterior margin, on the third dilated behind on the ends; on the fourth rather deeply marginate on each side behind, the ends rounded and extending backward; fifth segment with the anterior angles yellow and sometimes two projections from the anterior margin near the middle; hypopygium reddish yellow, on the half above shining black. In other specimens the yellow cross-band of the second segment may be confined to a small spot on each side or wholly wanting, the median stripe of the third and fourth segment wholly wanting, on the fourth only four small anterior spots, those on the anterior angles of the fifth very small, and the hypopygium almost wholly black. Front and middle legs yellow; hind femora black, except the base, in the female less extensive, often only a brown ring; hind tibiæ indistinctly biannulate with brown; and the hind tarsi brownish. Wings nearly hyaline, veins mostly black.

Twelve specimens from California, Washington Territory, and Connecticut.

Mesograpta aurulenta, n. sp.

Habitat.—San Domingo!

♂. Length, 5.5^{mm}. Face and frontal triangle light translucent yellow; cheeks narrowly shining black, behind and on the posterior orbits with a greenish tinge, covered with light yellowish pollen. Eyes briefly contiguous; vertical triangle black, elongate; ocelli remote from the vertex. Antennæ yellow; somewhat blackish above. Lateral stripes of thorax entire, yellow; dorsum black, but little shining, with three olivaceous stripes, separated by about their own width; pleuræ shining black, an elongate spot on the mesopleuræ, and an oval one below it, yellowish. Scutellum black, with a narrow yellow border. Abdomen yellowish red, or reddish yellow, with a bright golden-yellow metallic reflection; first segment more brownish. Legs reddish yellow; front femora with a small black spot above near the base; middle femora with a larger spot in the same place, and the last two joints of the tarsi black; hind femora with two incomplete black rings, one basal and one preapical; hind tibiæ also with two narrow black rings; hind metatarsi brownish, and the last two joints of tarsi black; hind femora thickened. Wings lightly tinged with dark; third vein gently sinuate.

♀. Front shining black, narrowly yellow on the sides. Abdomen yellowish red, but little shining; the first segment on the sides, a small spot in the middle of the second segment behind, and a minute one on each of the following segments, all sometimes obsolete, black; second, third, and fourth segments with narrow hind margins, and the fifth segment wholly, shining metallic golden, as in the male. Front much narrowed above; face with a broad median black stripe.

Four specimens (two ♂ and two ♀), San Domingo (G. F. Frazar).

Mesograpta Boscii.

Syrphus Boscii Macquart, Dipt Exot., ii, 2, 100, 23; pl. xvii, fig. 2.
Syrphus Gurges Walker, Dipt. Saunders, 236 (Osten Sacken).

Habitat.—Carolina (Macq.), Alabama, Florida (O. S.).

♀. Length, 5^{mm}. Thorace nigro, lateribus flavis; scutello nigro, rufomarginato. Abdomine rufo, nigro variegato. Femoribus posticis annulo fusco. Face courte, proéminente, jaune; côtés à duvet blanchâtre. Front d'un noir bleuâtre luisant, bordé de fauve. Antennes fauves. Abdomen ovalaire alongé; premier segment noir; deuxième à moitié antérieure fauve, postérieure noire; troisième et quatrième fauves, à bande dorsale noire, renflée, arrondie vers le bord antérieur et divisée par une ligne fauve, élargie au bord postérieur; ce bord noir, émettant deux rameaux triangulaires de chaque côté; cinquième fauve, à trois lignes noires, longitudinales. Pieds jaunes; cuisses postérieures à anneau brun près de l'extrémité; jambes postérieures à deux anneaux brunâtres peu distincts. Ailes un peu jaunâtres; cellule basilaire externe s'étendant jusqu'au tiers de la discoïdale.—Macquart.

Thorax black, the sides yellow; scutellum black, margined with yellow. Abdomen red, variegated with black. Hind femora with a brown ring. Face short, prominent, yellow; the sides white dusted. Front shining bluish black, yellow on the sides. Antennæ luteous. Abdomen elongate oval; first segment black; second on the anterior half luteous, posterior half black; third and fourth luteous, with a black stripe, dilated, rounded near the front border and divided by a luteous line, enlarged at the hind border, the hind border black, emitting two triangular branches on each side; fifth luteous, with three black linear stripes. Legs yellow; hind femora with a brown ring near the tip; hind tibiæ with two indistinct brown rings. Wings a little yellowish.—Translation.

ADDITIONAL NORTH AMERICAN SPECIES.

Mesograpta anchorata Osten Sacken, Cat. Dipt., 125.
Syrphus anchoratus Macquart, Dipt. Exot., ii, 2, 97; tab. xvi, fig. 8.
Mesograpta arcifera Loew, Centur., vi, 52.—Cuba.
Mesograpta basilaris v. d. Wulp, Tijdschr. v. Entom., xxvi.—Guadeloupe.
Syrphus basilaris Wiedemann, Auss. Zw. Ins., ii, 143, 48.
Mesograpta ectypus Osten Sacken, Cat. Dipt., 125.—Cuba.
Syrphus ectypus Say, J. Acad. Phil., vi, 165, 3; Compl. Wr., ii, 359.
Mesograpta laciniosa Loew, Centur., vi, 50.—Cuba.
Mesograpta linearis v. d. Wulp, Tijdschr. v. Entom., xxvi.—Mexico.
Mesograpta minuta Osten Sacken, Cat. Dipt., 125.—Cuba.
Syrphus minutus Wiedemann, Auss. Zw. Ins. ii, 146, Brazil; Bigot in R. de la Sagra, etc., 806.
Mesograpta multipunctata v. d. Wulp, Tijdschr. v. Entom., xxvi.—Guadeloupe.
Mesograpta poecilogastra Loew, Centur., vi, 51.—Cuba.
Mesograpta pulchella Osten Sacken, Cat. Dipt., 125.
Syrphus pulchellus Macquart, Dipt. Exot. 1er Suppl., 138, 36; tab. xi, fig. 12.
Mesograpta subannulata Loew, Centur., vi, 48.—Cuba.
Mesograpta variabilis v. d. Wulp, Tijdschr. v. Entom., xxvi.—Guadeloupe.

SPHÆROPHORIA.*

Sphærophoria St. Fargeau and Serville, Encycl. Meth., x, 513, 1825; Macquart, Dipt. du Nord, 1829.
Melithreptus Loew, Oken's Isis, 1840, 573.

Slender, small species, of a black or metallic green color, with yellow abdominal bands and yellow lateral stripes on the thorax. Antennæ short, a little remote at their base, third joint oval, arista dorsal, bare, or slightly pubescent. Face below somewhat projecting, lightly tuberculate, yellow, with or without a median black stripe. Eyes bare, contiguous in the male; ocelli remote from the vertex. Thorax with yellow, interrupted or entire, lateral stripes. Scutellum yellow. Abdomen slender, elongate, pointed at the tip in the female, clubbed with projecting hypopygium in the male (except *S. micrura*). Legs slender, simple. Wings in the male often shorter than the abdomen; neuration as in Syrphus. Type of genus, *S. scripta* Linné.

This genus is a very difficult one, and I have not attempted its thorough solution, which must be left to the monographer with an abundance of material at his disposal. In Europe much uncertainty yet prevails as to the specific characters.

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* *Σφαιρος*, sphere; *φορά*, bearing.

TABLE OF SPECIES.

1.—Hypopygium very small; coxæ and base of femora black . . . . . **micrura**
Hypopygium large 2
2.—Coxæ and base of femora blackish . . . . **melanosa**
Coxæ or at least femora not blackish (♂) 3
3.—Hypopygium with a tuft of yellow pile below the globular part in front, **cylindrica**
Hypopygium without such a tuft, base . . . . **sulphuripes**

For other species see descriptions.

Sphærophoria cylindrica. (Plate IV, figs. 16, 16*a*.)

Syrphus cylindricus Say, Amer. Ent., i, pl. xi; Compl. Wr., i, 22; Wiedemann, Auss. Zw. Ins., ii, 138, 38.

Sphoerophoria contigua Macquart, Dipt. Exot., 2^{e} Suppl., 62, 4.

Habitat.—New England, Washington Territory!

♂. Length, 8^{mm}. Face and front light yellow, shining; tubercle and anterior oral margin somewhat fuscous. Antennæ reddish yellow, brownish above on third joint. Dorsum of thorax dark greenish olivaceous, somewhat shining, with an abbreviated lateral yellow stripe; pleuræ deep shining, somewhat bluish black, with light yellow spots, scutellum sulphur yellow. Abdomen slender; first segment black; second segment opaque black in front, with a broad yellow cross-band in the middle, opaque brown or black behind; third segment narrowly brown or blackish in front and behind, elsewhere reddish yellow; fourth segment yellow and obscurely brownish; fifth segment and hypopygium, wholly reddish yellow, the latter globose and with a tuft of pile below in front. Legs yellow, including the coxæ. Wings nearly hyaline, not exceeding the abdomen.

This description applies nearly to typical specimens, but there is much variation, how much of which is varietal and how much specific I cannot say. The following are some of the differences I have observed:

(*a*) ♂. Larger (10^{mm}), abdomen slender, banded, more blackish; yellow lateral stripes of thorax entire. New England, Washington Territory.

(*b*) ♂. Smaller (6^{mm}), abdomen more blackish, coxæ black, base of femora blackish.

(*c*) ♀. Front shining black, yellow on the sides below; yellow lateral stripes of thorax entire. Abdomen moderately broad, shining black with three moderately arcuate, slender, entire bands, reaching the lateral margins; fifth segment with an interrupted band; coxæ and legs yellow; face yellow. New England.

(*d*) ♀. Face with an elongate, oval, shining black spot; lateral thoracic stripes abbreviated at the suture; abdomen slender, black, with three yellow bands, narrowly opaque in front and behind these; fifth segment with a yellow hind margin. New England.

Sphærophoria sulphuripes.

Syrphus sulphuripes Thomson, Eugenies Resa, 501.
Sphærophoria sulphuripes Osten Sacken, West. Dipt., 330.

Habitat.—California!

♂. Length, 8 to 9mm. Face and front livid yellow; cheeks brown behind. Antennæ yellow, third joint brownish above. Thorax olivaceous black, but little metallic; ante-sutural lateral stripes broad; scutellum light ochraceous yellow, with light pile; pleuræ shining black, somewhat bluish, with light yellow spots. Abdomen black, with three yellow or orange bands, slightly arcuate, entire; in front of and behind each yellow band, more broadly on the second segment, opaque black; elsewhere the abdomen is shining, more or less metallic; fifth segment with two red or orange spots; hypopygium yellow or red, more or less blackish behind. Legs, including the coxæ, yellow; the tarsi, especially the hind pair, ochraceous. Wings nearly hyaline; a little exceeding the tip of the abdomen.

Two specimens, Southern California. With these there are others, which probably belong to the same species, differing in the abdominal bands being broader, the color less black and less opaque, and the fourth and fifth segments reddish with brownish marks.

Sphærophoria melanosa, n. sp.

Habitat.—California!

♂. Length, 8mm. Front and face light, livid, greenish-yellow, the facial tubercle fuscous, and the oral margin in front narrowly brownish. Cheeks metallic greenish black behind; antennæ reddish-yellow; third joint brown above. Dorsum of thorax metallic greenish-black; the ante-sutural yellow stripes not very broad; pleuræ deep, shining black, somewhat bluish, with light yellow spots. Abdomen opaque black; first segment, very narrow hind margin of the second, broader hind margin of the third and fourth, and the fifth segment, except a median spot, shining metallic; first segment with a narrow, narrowly interrupted, yellow band; third with a broader entire one, not reaching to the lateral margins; fourth with two narrowly separated spots in front; fifth with two smaller ones. Hypopygium globular, not pilose, red, black behind. Coxæ black, the hind pair with a yellow spot behind; femora blackish on the basal half, distal portion and tibiæ yellow and luteous; tarsi brown. Wings nearly hyaline, slightly exceeding the abdomen in length.

♀. Front deeply shining black, narrowly yellow on the sides to near the middle. Abdomen moderately shining, black; second, third, and fourth segments each with a slender, gently arcuate, yellow cross-band, attaining the lateral margins; the first one very narrowly interrupted in the middle. Legs, including all the coxæ, light yellow; the tarsi, especially the hind pair, ochraceous.

This description is from two specimens, sent me by Mr. Coquillett, pinned together and bearing a label, "Taken in coitu." The great difference in the legs would have furnished good grounds for believing the specimens to be specifically distinct, had they not been taken together.

With these two specimens were several others, all males, agreeing closely, except that the metallic color of the abdomen is more extensive. Two other males have the spots on the fourth segment coalescent and the femora less black toward the base. One male has the face distinctly blackish on the tubercle and oral margin; the abdomen deep black, with the three narrow cross-bands all interrupted; the femora almost wholly black; and the tibiæ and tarsi much darker than the male first described; the hypopygium also in large part black. Another male differs from the first only in the bands being narrower and all interrupted. All these differences are probably only individual. Other males resembling these, but with the hind coxæ and the legs wholly yellow, may be specifically different.

Sphærophoria micrura.

Sphærophoria micrura Osten Sacken, West. Dipt., 330.

Habitat.—California!

♂. Length, 7.5 to 9^{mm}. Face light yellow, often with a greenish tinge, with a brown or blackish stripe not reaching the antennæ; cheeks metallic greenish black behind, frontal triangle with a large shield-shaped, greenish metallic or shining black spot; the interval between the spot and the eyes is yellow, and yellow pollinose, antennæ red or reddish brown; the third joint blackish above, below red. Thorax dark metallic green, the yellow lateral stripes only reaching the suture; scutellum yellow, with black pile; pleuræ dark metallic, somewhat bluish, without light yellow spots. Abdomen black; first segment yellow on the anterior angles; second, third and fourth segments each with a straight yellow cross band near the middle and attaining the lateral margins, in front and behind with an opaque black cross band; the hind margins shining bluish black; that on the second segment is the narrowest and sometimes narrowly interrupted; fifth segment with yellow sides and two yellow streaks in the middle. Hypopygium black, very small. Legs dark brown or black; the ends of the four front femora more or less brownish-yellow. Wings with a brownish tinge.

Four specimens, Southern California.

Sphærophoria scripta.

Musca scripta Linné, Fauna Suec., p. 1820.

Conops gemmatus Scopoli, Entom. Carniolica, 965.

Syrphus scriptus Fabricius, Spec. Ins., ii, 434, 62; id., Ent. Syst., iv, 308, 113; Meigen, Syst. Beschr., iii, 324, 73.

Scæva scripta Fabricius, Syst. Antl., 252, 17.

Sphærophoria scripta Macquart, Hist. Nat. Dipt., i, 551, 1; Zetterstedt, Dipt. Scand., ii, 766, 1; Walker, List, etc., iii, 593.

Melithreptus scriptus Schiner, Fauna Austr., i, 316; v. d. Wulp, Tijdschr. v. Entom, xxvi.

Habitat.—Canada (v. d. Wulp), Europe.

♂. Length, 10 to 12^{mm}. Abdomen of the male extending beyond the wings, the first yellow band contiguous with the lateral margins. Yellow bands distinctly limited only on the front part of the abdomen; on the posterior part the black ground color almost wholly obsolete, or for the greater part changed into a brownish color, in which variously formed vittulæ and spots appear. Thorax dark metallic green, feebly shining, with three, often indistinct, longitudinal black stripes, and yellow, entire, lateral stripes; scutellum yellow. Abdominal bands in front and behind somewhat emarginate (ausgerandet), the first and fourth sometimes interrupted by a black line. Face whitish yellow, with a mother-of-pearl lustre; front yellow; antennæ reddish-yellow, at the tip sometimes brownish. Legs reddish-yellow, tarsi somewhat darker; hind tibiæ on the distal half thickly beset below with short, blackish bristles. Wings hyaline, scarcely tinged with brownish-yellow.

♀. Front yellow, the vertex black, extended as a median stripe nearly to the antennæ. Abdomen broad and wholly black, with four yellow bands, the first usually interrupted, the following ones emarginate behind, the fourth broadly interrupted.—Schiner, l. c., translation.

The species is a very variable one, and very common throughout Europe. I give it on the authority of Mr. v. d. Wulp. I have not identified it with any certainty myself, the specimens designated by *a* under *S. cylindrica* approaching it most closely, but differing in the abdominal bands being neither emarginate nor interrupted.

Sphærophoria dubia.

Sphærophoria dubia Bigot, Ann. Soc. Ent. Fr., 1884, 101.

Habitat.—California.

♂. Long. 7mm. Antennis testaceis, apice infuscatis, fronte et facie pallidissimè flavis; thorace nigro, parum æenescente; calyptris et halteribus testaceis; abdomine fulvo, basi latè, vittis tribus transversis latis, lineâ segmenti quinti intermediâ, brevi, maculis duo, utrinque, lunulatis, oppositis, sexti maculis simillimis, nigris; pedibus flavis, tarsis flavo obscuro tinctis.

Antennes d'un fauve pâle, bords supérieurs et chète, bruns; face et front entièrement d'un blanc jaunâtre; thorax d'un noir un peu bronzé; cuillerons et balanciers testacés; abdomen fauve avec la base largement noire, incisions des 2e et 3e segments, bords du 4e, couverts par trois larges bandes transversales, noires, 5e avec une bande dorsale et deux macules en forme de croissant, opposées par leurs pointes, 6e avec deux macules semblables, le tout de couleur noire; pieds d'un jaune assez pâle, tarses d'un brun clair, un peu roussâtre. Ailes ne dépassant pas l'abdomen; face saillante, obtuse, calleuse; antennes, 3e segment presque orbiculaire. 1 specim.—Bigot, l. c.

Sphærophoria pyrrhina.

Sphærophoria pyrrhina Bigot, Ann. Soc. Ent. Fr., 1884, 101.

Habitat.—California.

♂. Long. 6mm. Antennis fulvis, apice fuscis; facie flavâ, callositate fulvâ; thorace æenescente; calyptris ferè albis, halteribus flavis; abdomine fulvo, segmento 1° nigro, lineâ intermediâ vittisque transversis tribus, tertiâ interruptâ, maculis segmentorum quartis et quintis, utrinque, nigris; pedibus pallidè testaceis, tibiis posticorum basi, tarsisque totis, pallidè rufis.

Antennes fauves, extrémité du 3ᵉ segment et chète, noirâtres; face d'un jaune blanchâtre, médians d'un fauve luisant; front jaune; thorax bronzé; abdomen d'un fauve rougeâtre, 1ᵉʳ segment noir, une ligne médiane interrompue, élargie vers les incisions, au 6ᵉ segment, trois larges bandes transversales situées sur lesdites incisions, la 3ᵉ doublement interrompue, deux points arrondis, de chaque côté, sur le 5ᵉ, et quatre macules irrégulières sur le 6ᵉ segment, noirs; cuillerons blanchâtres, balanciers jaunes. Ailes ne dépassant pas l'abdomen; face saillante, obtuse, calleuse; antennes, 3ᵉ segment orbiculaire. 1 specim.—Bigot, l. c.

Sphærophoria infumata.

Syrphus infumatus Thomson, Eugenies Resa, 501.

Habitat.—California (Thomson).

Æneo-niger, epistomate, pectoris maculis lineaque frontali utrinque albido-margarita-ceis, antennis, vitta laterali abbreviata thoracis, scutello, pedibus fasciisque abdominis flavis, alis leviter infumatis. ♂ ♀. Long. 5–6^{mm}.

Præcedenti [*S. sulphuripes*] simillimus sed parum æneo-micans, antennis articulo 3° ovali-rotundato, linea media impressa frontali obsoleta, gula æneo-fusca, alis leviter infumatis, abdomine fascia 1ᵃ integra, coxis anterioribus nigricantibus, apice flavis distinctus.

Mas differt coxis omnibus fusco-nigris, apice pallidis, abdomine segmentis 4–6 rubris, signaturis fusco-æneis vix ullis.—Thomson, l. c.

ADDITIONAL NORTH AMERICAN SPECIES.

Sphærophoria fulvicauda Bigot, Ann. Soc. Ent. Fr., 1884, 104.—Mexico.

Sphærophoria nasuta Bigot, Ann. Soc. Ent. Fr., 1884, 103.—Mexico.

Sphærophoria pachypyga Bigot, Ann. Soc. Ent. Fr., 1884, 104.—Mexico.

Sphærophoria picta Macquart, Hist. Nat. Dipt., i, 553, 8; Zetterstedt, Dipt. Scand., ii, 772; viii, 3161, 7; Holmgren, Ins. Nordgroenl., 100.—Greenland.

Syrphus pictus Meigen, Syst. Beschr., iii, 326, 77.

Melithreptus pictus Schiner, Fauna Austriaca, i, 317.

Sphærophoria pleticauda Bigot, Ann. Soc. Ent. Fr., 1884, 102.—Mexico.

Sphærophoria strigata Stäger, Groenl. Antl., 362, 31; Holmgren, Ins. Nordgroenl., 100.—Greenland.

Sphærophoria hieroglyphica Meigen, Syst. Beschr., iii, 327, 78.

Sphærophoria menthastri Linné, Meigen, Syst. Beschr., iii, 325, 75.

Walker, List, etc., iii, 593, mentions these European species as occurring in Nova Scotia, but his statement is of little value without confirmation.

PELECOCERA.*

Pelecocera Meigen, Syst. Beschr., iii, 340, 1822.
Euceratomyia Williston (non Bigot), Wiener Entom. Zeit., iii, 185, 1884.

Small, nearly bare, black species, the sides of the face, and the abdomen, with yellowish markings. Head broader than the thorax; front of the male very broad, not narrowed above. Eyes bare. Face bare, lightly concave above, moderately produced downward, and with a large convex gibbosity below. Antennæ large, first two joints very short, third joint very much elongated, compressed, strongly dilated below at the base, the terminal portion slender, cylindrical, ending in a short, thickened, two-jointed, pubescent style. Abdomen of nearly equal width, depressed, about as broad as the thorax; hypopygium small. Feet simple, the femora not thickened. Marginal cell of wings open, third longitudinal vein gently convex in front; anterior cross-vein near base of discal cell, rectangular. Type of genus *P. tricincta* Meigen, Europe.

This definition is drawn from specimens of *P. Pergandei*, but it only requires slight modifications to adapt it to the four other known, European species, specimens of two of which (*P. latifrons* Loew and *P. scaevoides* Fall.) I have compared, through the kindness of Professor Mik. In *P. latifrons* the structure of the antennæ is very nearly like what it appears to be in the female of *P. Pergandei*, except that the style is much more slender; the face is also more protuberant below. *P. scaevoides* differs distinctly in the third joint of the antennæ being more oval, and in the style being more slender and dorsal, not terminal. *P. Pergandei* is thus nearest allied to *P. latifrons* of any of the described species, and cannot be separated. The genus I first described as *Euceratomyia*, overlooking *Pelecocera*, and it was not till I casually read the description of Loew's species that I recognized the relationship of my specimen. Mr. Bigot's determination of the species, from my descriptions, as a member of the genus *Merapioides* is of course wholly inadmissible.

Pelecocera Pergandei. (Plate IV, fig. 13.)

Euceratomyia Pergandei Williston, Wien. Ent. Zeit., iii, p. 186, fig.
Merapioides Pergandei Bigot, Wien. Ent. Zeit., iii, 217.
Pelecocera Pergandei Williston, Bull. Brooklyn Ent. Soc., vii, 139.

Habitat.—District of Columbia!

♂. Length, 7^{mm}. Head black; face yellow, with a broad median stripe, narrowed somewhat above, and the cheeks, shining black; antennæ reddish yellow, the upper border and the tip of the third joint and the style blackish. Front shining black, very broad, lightly grooved across the middle. Thorax shining greenish black, on the humeri a spot of whitish dust, extending back nearly to the root of the wings. Abdomen scarcely broader than the thorax, a little broader at the tip

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*Πέλεκυς, an axe; κέρας, horn.

of the third segment; black, except the fifth segment and the hypopygium, but slightly shining; second segment across the middle with two coalescent transverse spots; the third and fourth segments on the basal half reddish or brownish yellow. Coxæ and legs yellow, the four front femora and tibiæ in the middle yellowish brown, the hind legs, with the exception of the base and extreme tip of the femora, black. Pile of the whole body short, soft, and sparse. Wings hyaline, the outer part cinereous; stigma brownish yellowish.

One specimen, District of Columbia (Theo. Pergande).

A female discovered with the last, which I have since examined, has the second abdominal segment with a broad median band, the third segment, except the narrow hind margin, and the anterior two-thirds of the fourth segment, all pure yellowish red. The abdomen is of nearly equal width throughout, scarcely at all wider than the thorax. The third joint of the antennæ does not appear to be produced into a cylindrical process, but the projection, which is as long as in the male, seems to be wholly composed of the style.

NEOASCIA, NOM. NOV.*

Ascia Meigen (non Scopoli), Syst. Beschr., iii, 185, 1822.

Small, slender, nearly bare species, black or metallic green, with or without reddish or yellow on the abdomen. Antennæ shorter than the head; third joint oval or obtusely pointed; arista near the middle of the joint, bare. Face black, even, without tubercle, conically produced downward and forward, so that the profile is gently and evenly concave from base of antennæ to oral margin. Eyes bare, separated by the front, which is rather broad in the female, narrower in the male. Abdomen about twice as long as the thorax; second segment narrow, widened posteriorly; third and fourth broad and arched; in outline short club shaped. Front and middle legs slender, hind femora very much thickened and with a row of short spines below; hind tibiæ bent. Marginal cell of wings open; anterior cross-vein before the middle of the discal cell; the last section of the fourth vein joins the third in a right angle, the anterior angle of discal cell also a right angle; third longitudinal vein straight.

Neoascia globosa. (Plate IV, figs. 10, 10*a*.)

Ascia globosa Walker, List, etc., iii, 546.
Ascia metallica Williston, Proc. Am. Phil. Soc., xx, 315.
Ascia nasuta Bigot, Annales Soc. Ent. de France, 1883, 327.
Ascia quadrinotata Bigot, ibid.
Ascia albipes Bigot, ibid., p. 328.

Habitat.—New England, Oregon!

♀. Length, 3½ to 5^{mm}. Front bronze black, shining, delicately roughened. Face with a bluish reflection, lightly covered with whitish

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*Νέος, new; *ascia*, a mason's trowel.

pollen. Antennæ blackish, third joint on the lower part red. Thorax metallic greenish bronze, moderately shining, lightly roughened. Abdomen lightly punctulate, wholly black, moderately shining. Legs yellow; front and middle femora black, except base and tip, the hind femora except the base; hind tibiæ with a ring beyond the middle blackish; and first and last joints of hind tarsi black. Wings nearly hyaline, stigma dilutely yellow.

A single female specimen from Connecticut agrees with Walker's description, and may therefore be considered typical. The species, however, either varies remarkably in its abdomen and legs, or there are a number of closely allied species; being unable to decide this from the material I have, I will describe the different varieties.

First var., *albipes* Bigot, ♂, ♀. Abdomen with two complete reddish yellow bands, front and middle legs wholly yellow; in the male the hind tibiæ chiefly black, bands sometimes interrupted, fourth segment and hypopygium bronze metallic. Seven specimens, Connecticut.

Second var., ♀. Legs as in preceding, abdomen wholly black. Two specimens, Connecticut.

Third var., ♂. Abdomen with two interrupted bands, front and middle femora and tibiæ with a black ring. Two specimens, Connecticut.

Fourth var., *metallica*, ♀. Abdomen wholly black, or third segment with two small spots. Legs black, base and tip of tibiæ and tarsi yellow, tarsi otherwise brownish. Two specimens, Oregon.

One male from the last place has the base and tips of femora and tarsi more broadly yellow, and the abdomen with two bands (var. *nasuta ?*). In these last three specimens the third joint of the antennæ seems to be shorter and more rounded at the extremity than in the Eastern specimens. Possibly they may be entitled to specific rank, but I strongly suspect that all these differences are but varieties of one widely distributed species.

The species described by Bigot as *nasuta* has a broad band on the second and third segments, the latter one sometimes divided in the middle. The legs are yellow, the femora black towards the base (the hind pair, except the tip), the tibiæ with a broad ring of the same color, the front tarsi with the first and last joint, the middle pair with the last joint, and the hind pair with the under side of all the joints largely, black. The specimens were from Mt. Hood. *A. quadrinotata*, from the same place, differs chiefly in there being four spots on the abdomen, and was suspected by its author of being a variety of the preceding. Should the differences in the antennæ (as above stated) indicate a different species, it would be entitled to the name *metallica*, of which Bigot's names would indicate varieties.

Neoascia distincta, n. sp.

Habitat.—Massachusetts !

♀. Length, 4^{mm}. Deep metallic green, shining. Front finely roughened; face whitish pollinose. Antennæ red, brownish on the upper border. Abdomen only a little narrowed toward the base. Legs yellow; front and middle femora toward the base, and a ring on hind tibiæ, blackish; hind femora, except the base, black. Wings nearly hyaline; stigma pale yellow; a minute stump of a vein on the outer cross-veins.

Two specimens, Beverly, Massachusetts, May 8 (E. Burgess, National Museum, Professor Riley's collection). This pretty species is very distinct from *N. globosa*, in the larger, more elongate antennæ, in the less produced epistoma, in the less spatulate, broader at the base, and more pointed abdomen, and in the nearly uniform bright metallic color.

SPHEGINA.

Sphegina Meigen, Syst. Beschr., iii, 193, 1822.

Small, nearly bare, slender species, black, brown, or yellow, more or less shining. Antennæ short, third joint rounded, the arista bare, basal. Face deeply concave in profile below the antennæ, the epistoma porrected, not descending below the eyes. Eyes bare, separate in the male; front of equal width, broader in the female. Abdomen twice or thrice as long as the thorax; at the base in the male pedicellate—in the female much contracted, but not so slender; third and fourth segments expanded, especially in the female, and convex above. Legs slender; hind femora much thickened, with short spines below; hind metatarsi thickened. Wings long and broad; marginal cell open, third vein straight, anterior outer angle of first posterior cell rectangular or acute; anterior cross-vein before the middle of discal cell. Type of genus, *S. clunipes* Fallen, Europe.

TABLE OF SPECIES.

1.	Wings large; abdomen short; front in female nearly as broad as long.	**infuscata**
	Front in female much longer than broad	**2**
2.	Fifth abdominal segment in female considerably broader than long . .	**lobata**
	Fifth segment in female but little broader than long	**3**
3.	Thorax more or less black	**rufiventris**
	Thorax not at all black (♀)	**Keeniana**

Sphegina Keeniana, n. sp. (Plate IV, fig. 11.)

Habitat.—Pennsylvania!

♀. Length, 5 to 6^{mm}. Front black, thickly dusted on the sides, leaving a slender, shining stripe, interrupted in the middle. Antennæ yellow, third joint rather large, orbicular. Face light yellow, blackish in the middle above; cheeks and occiput black, lightly dusted. Thorax yellow; the dorsum and scutellum darker, with a reddish cast; the lower part of the pleuræ behind, brown. Abdomen yellow, broad behind; first segment behind, obscure spots on the sides of the second segment in front, and small spots on the posterior angles of the fourth and fifth segments, blackish; second and third segments on the posterior part with a rather narrow, black cross-band; fifth segment moderately broader than long. Coxæ and legs white; a broad preapical ring on the hind femora, hind metatarsi, and the last two joints of all the tarsi, black; two small, incomplete rings on the hind tibiæ, blackish. Wings hyaline.

♂. Thorax blackish above, sometimes wholly black except the humeri and below them. Abdomen of moderate length, sometimes nearly black, except the basal part of the third segment, the fourth segment always more brown than in the female; front and middle tibiæ sometimes faintly brownish near their middle.

This species differs from *lobata*, to which it is most nearly allied, besides the coloration, in the anterior distal angle of the first posterior cell being more acute, and the abdomen of the male being very much less slender. Four female and three male specimens, captured by Mr. Eugene L. Keen, in Fairmount Park, Philadelphia, May 21. The black markings, in both male and female, vary much in intensity on the abdomen.

Sphegina infuscata. (Plate IV; fig. 12.)

Sphegina infuscata Loew, Centur., iii, 23.

Habitat.—Sitka (Loew), Oregon!

♂, ♀. Length, 5 to 6¼^{mm}, of wings 6¼ to 6⅔^{mm}. Head black, opaque; front of male narrower than that of female, and clothed with longer, black pile. Antennæ black. Thorax fuscous black; the dorsum with delicate pile, longer and more obscure in the male than in the female. Scutellum and metanotum of the same color as the thorax. Abdomen shorter than in the species indigenous to Europe, and attenuate near the base, in the male fuscous, in the female reddish testaceous. Legs of the male fuscous, of the female reddish testaceous. Wings large, dilutely infuscate; stigma elongate, fuscous, apical angle of first posterior cell acute.—Translation from Loew, compared with the types.

A single specimen from Mount Hood, Oregon, probably belongs to this species, most especially characterized by the short abdomen, the large wings, and acute posterior cell. The specimen, a female, however, has the abdomen and legs wholly light-yellow, and thorax more brown than black; it may be teneral.

Sphegina rufiventris.

Sphegina rufiventris Loew, Centur., iii, 22.

Habitat.—New York (Lw.), Washington Territory!

♀. Length, 6½^{mm}. A very variable species. Red. Dorsum of thorax, except the humeri and posterior angles, always black, sometimes the thorax almost wholly black. Front black, of equal width. Face yellowish, above somewhat blackish. Occiput black. Third joint of the antennæ fuscous or black. Scutellum sometimes red, often piceous, rarely black. Abdomen red, shining; base often black, distal half less broad than in *S. lobata*. Front and middle legs yellowish, last two joints of the tarsi black; posterior legs brownish-red, femora and tibiæ yellow at the base, tip of tibiæ and tarsi fuscous-black, the intermediate tarsal joints often less deeply so. Wings subhyaline, or subfuscous towards the tip; apical angle of first posterior cell rectangular.

From *S. lobata* this species differs, besides the color of the body, in the last segment of the abdomen being less broad, and the hind femora less incrassate.—Translation from Loew, compared with the type.

A single female specimen from Washington Territory agrees perfectly with this description, except that I do not see that the hind femora are less incrassate than in *S. lobata.* The third joint of the antennæ, the thorax wholly, and the base of the abdomen are black.

Sphegina lobata.

Sphegina lobata Loew, Centur., iii, 21.

Habitat.—White Mountains, New Hampshire, Oregon!, Middle States (Lw.)

Length, 6½mm. Male. Head black. Face nearly wholly white. Eyes separate; front of equal width; antennæ luteous, arista sub-fuscous. Thorax shining black; humeri and lateral spots of the dorsum testaceous. Scutellum and abdomen black, shining; basal fascia of the third abdominal segment yellow; anterior angles and posterior margin of the fourth segment testaceous. Hypopygium globose, black. Left angle of the last ventral segment produced into a large fuscous testaceous lobe. Coxæ and feet, whitish; distal half of the hind femora, except the extreme tip, black; basal half of hind tibiæ fuscous; distal portion imperfectly black annulate. Last two joints of the front, and the first and last two of the hind tarsi, black—the intermediate ones subfuscous. Wings subfuscous, stigma a little more obscure; apical angle of the first posterior cell a right one.

Female. Very similar to the male. Front a little broader. Distal half of abdomen strongly dilated, the third and fourth segments with two spots, large, testaceous, subobsolete; fifth segment sordid white. Last two joints of the four front tarsi blackish; hind tarsi black, intermediate joints a little less so.—Translation.

Three specimens from Mount Washington, New Hampshire (Dr. George Dimmock, Nos. 1494–7–8), and one male from Mount Hood, Oregon, I have no doubt belong with this species, which is evidently variable. For this reason I have chosen rather to reproduce the original in translation and point out the differences. The female agrees throughout, except that the humeri and interrupted bands of the abdomen are light yellow. The third joint of the antennæ in the males is more blackish than luteous, the face is blackish on the upper part; the reddish color of the humeri and post-alar callus not very apparent in all but one specimen. In the Eastern males the distal half of the second segment of the abdomen (in one specimen the third wholly and the fourth except a darker band in the middle) is red, the hypopygium more black-

Sphærophoria sulphuripes.

Syrphus sulphuripes Thomson, Eugenies Resa, 501.

Sphærophoria sulphuripes Osten Sacken, West. Dipt., 330.

Habitat.—California!

♂. Length, 8 to 9^{mm}. Face and front livid yellow; cheeks brown behind. Antennæ yellow, third joint brownish above. Thorax olivaceous black, but little metallic; ante-sutural lateral stripes broad; scutellum light ochraceous yellow, with light pile; pleuræ shining black, somewhat bluish, with light yellow spots. Abdomen black, with three yellow or orange bands, slightly arcuate, entire; in front of and behind each yellow band, more broadly on the second segment, opaque black; elsewhere the abdomen is shining, more or less metallic; fifth segment with two red or orange spots; hypopygium yellow or red, more or less blackish behind. Legs, including the coxæ, yellow; the tarsi, especially the hind pair, ochraceous. Wings nearly hyaline; a little exceeding the tip of the abdomen.

Two specimens, Southern California. With these there are others, which probably belong to the same species, differing in the abdominal bands being broader, the color less black and less opaque, and the fourth and fifth segments reddish with brownish marks.

Sphærophoria melanosa, n. sp.

Habitat.—California!

♂. Length, 8^{mm}. Front and face light, livid, greenish-yellow, the facial tubercle fuscous, and the oral margin in front narrowly brownish. Cheeks metallic greenish black behind; antennæ reddish-yellow; third joint brown above. Dorsum of thorax metallic greenish-black; the ante-sutural yellow stripes not very broad; pleuræ deep, shining black, somewhat bluish, with light yellow spots. Abdomen opaque black; first segment, very narrow hind margin of the second, broader hind margin of the third and fourth, and the fifth segment, except a median spot, shining metallic; first segment with a narrow, narrowly interrupted, yellow band; third with a broader entire one, not reaching to the lateral margins; fourth with two narrowly separated spots in front; fifth with two smaller ones. Hypopygium globular, not pilose, red, black behind. Coxæ black, the hind pair with a yellow spot behind; femora blackish on the basal half, distal portion and tibiæ yellow and luteous; tarsi brown. Wings nearly hyaline, slightly exceeding the abdomen in length.

♀. Front deeply shining black, narrowly yellow on the sides to near the middle. Abdomen moderately shining, black; second, third, and fourth segments each with a slender, gently arcuate, yellow cross-band, attaining the lateral margins; the first one very narrowly interrupted in the middle. Legs, including all the coxæ, light yellow; the tarsi, especially the hind pair, ochraceous.

This description is from two specimens, sent me by Mr. Coquillett, pinned together and bearing a label, "Taken in coitu." The great difference in the legs would have furnished good grounds for believing the specimens to be specifically distinct, had they not been taken together.

With these two specimens were several others, all males, agreeing closely, except that the metallic color of the abdomen is more extensive. Two other males have the spots on the fourth segment coalescent and the femora less black toward the base. One male has the face distinctly blackish on the tubercle and oral margin; the abdomen deep black, with the three narrow cross-bands all interrupted; the femora almost wholly black; and the tibiæ and tarsi much darker than the male first described; the hypopygium also in large part black. Another male differs from the first only in the bands being narrower and all interrupted. All these differences are probably only individual. Other males resembling these, but with the hind coxæ and the legs wholly yellow, may be specifically different.

Sphærophoria micrura.

Sphærophoria micrura Osten Sacken, West. Dipt., 330.

Habitat.—California!

♂. Length, 7.5 to 9mm. Face light yellow, often with a greenish tinge, with a brown or blackish stripe not reaching the antennæ; cheeks metallic greenish black behind, frontal triangle with a large shield-shaped, greenish metallic or shining black spot; the interval between the spot and the eyes is yellow, and yellow pollinose, antennæ red or reddish brown; the third joint blackish above, below red. Thorax dark metallic green, the yellow lateral stripes only reaching the suture; scutellum yellow, with black pile; pleuræ dark metallic, somewhat bluish, without light yellow spots. Abdomen black; first segment yellow on the anterior angles; second, third and fourth segments each with a straight yellow cross band near the middle and attaining the lateral margins, in front and behind with an opaque black cross band; the hind margins shining bluish black; that on the second segment is the narrowest and sometimes narrowly interrupted; fifth segment with yellow sides and two yellow streaks in the middle. Hypopygium black, very small. Legs dark brown or black; the ends of the four front femora more or less brownish-yellow. Wings with a brownish tinge.

Four specimens, Southern California.

Sphærophoria scripta.

Musca scripta Linné, Fauna Suec., p. 1820.

Conops gemmatus Scopoli, Entom. Carniolica, 965.

Syrphus scriptus Fabricius, Spec. Ins., ii, 434, 62; id., Ent. Syst., iv, 308, 113; Meigen, Syst. Beschr., iii, 324, 73.

Scæva scripta Fabricius, Syst. Antl., 252, 17.

Sphærophoria scripta Macquart, Hist. Nat. Dipt., i, 551, 1; Zetterstedt, Dipt. Scand., ii, 766, 1; Walker, List, etc., iii, 593.

Melithreptus scriptus Schiner, Fauna Austr., i, 316; v. d. Wulp, Tijdschr. v. Entom, xxvi.

Habitat.—Canada (v. d. Wulp), Europe.

♂. Length, 10 to 12mm. Abdomen of the male extending beyond the wings, the first yellow band contiguous with the lateral margins. Yellow bands distinctly limited only on the front part of the abdomen; on connect with the broad facial stripe, shining black. Antennæ reddish brown, third joint elongate-oval. Front only moderately narrowed at the vertex, more than half as wide as at the base of the antennæ, shining greenish black, on the sides below the yellow of the face extends up along the eyes; the distance from the ocelli to the base of the antennæ is considerably less than from thence to oral-margin. Eyes very little convergent on lower part of head. Thorax shining greenish blue, pleuræ with white pile. Scutellum yellow, brown or brownish across the disk. Abdomen slender at the second segment, rather broadly spatulate at the distal part; first segment black; second and third segments brownish black, lighter in front; on the sides at the front end yellow and with white pile; fourth segment black, with a yellow, interrupted, white pilose cross-band in front; remainder of abdomen more shining metallic. Legs brownish, tarsi darker, tip of femora and base of tibiæ yellowish. Wings hyaline, brown along the front border from a little beyond the humeral cross-vein, more blackish on the stigma, reaching back in the middle to or beyond the origin of the third vein, and then evanescent outwards, anterior cross-vein near the basal third of discal cell; the third vein joins the costa immediately before the tip.

♂. Frontal triangle yellow, black immediately above the antennæ, the legs somewhat more yellowish, though this is probably not a sexual character. The wings differ distinctly in that the brown is wholly confined to the sub-costal cell, blackish at the stigma.

Two female specimens (Professor Riley) collected by Mr. William Patton, labeled "From spring larvæ among Cotton Aphides, Selma, Ala.," and one from Arizona (Professor Comstock); an additional specimen (Professor Riley) with the label "Pupa found in Orange. R. S. Turner, Saint George, Fla., May 7, '80;" also two male specimens (Professor Riley, No. 532, May 23, '80), Georgia?

The male has the costal and marginal cells hyaline, while in the female they are both in large part brown, yet it seems almost sure that they belong to the same species.

Baccha lugens.

Baccha lugens Loew, Centur., iii, 24.

Habitat.—New York (O. S.), Southern States!

♂. Length, 10^{mm}. Front black-bronze, black pilose, above the antennæ yellow spotted. First two joints of the antennæ yellow, black pilose; third joint black. Dorsum of thorax and the scutellum black-bronze, moderately shining, the color of the scutellum somewhat reddish bronze; lower half of pleuræ white-pollinose. Abdomen black, opaque, not clavate near the tip, the base and apical margin of each segment shining fuscous, ultimate segment wholly shining, sub-violaceous black. Legs black, front and middle femora, except the tip, base of hind femora, and of the front and middle tibiæ, yellow or yellowish red. Halteres sordid whitish, head with a black spot. Wings sub-cinerescent, all the veins, except the last segment of the fourth vein, broadly clouded with black, confluent near the costa. Face yellow, obscure on the sides, with opaque yellowish pollen.—Translation.

Two male specimens from Professor Riley without locality (No. 485, June 2, 1880,) evidently belong to this species. The front, however, lacks the yellow spots above the antennæ. The face in profile is narrow, only a little widened at the tubercle, nearly perpendicular and straight above it, and very receding below, the cheeks linear, and the eyes very convergent below. The meso-pleuræ are whitish pollinose, as well as below. The legs are yellowish, the end of all the femora, the end of front and middle tibiæ, and nearly all of the hind tibiæ, and all of the tarsi, brown. The small cross-vein is a little beyond the middle of the discal cell, and rectangular; the clouding of the wings along the veins, brown.

Baccha fuscipennis. (Plate IV, fig. 8.)

Baccha fuscipennis Say, J., Acad., Phil., iii, 100; Compl. Wr., ii, 86.
Ocyptamus fascipennis Macquart, Hist. Nat. Dipt., i, 554, 2; tab. xii, fig. 13; v. d. Wulp, Tijds. v. Ent., xxvi, 9.
Syrphus Amissas Walker, List, etc., iii, 589.
Syrphus Radaca Walker, List, etc., iii, 590.
Ocyptamus longiventris Loew, Centur., vii, 66.
Ocyptamus fuscipennis Osten Sacken, Cat. Dipt., 127.
? *Ocyptamus conformis* Loew, Centur., vii, 67.

Habitat.—New England, Florida, San Domingo, Kansas,! Guadeloupe (v. d. Wulp).

♂, ♀. Length, 9 to 11^{mm}. Antennæ situated near the middle of the head in profile; black, the first two joints and the third below sometimes reddish or yellowish. Frontal triangle considerably longer than the contiguity of the eyes, wholly bronze-black with black pile; front in the female very narrow at the vertex, greenish-black, attenuated above the antennæ by the yellow of the face, which extends up along the eyes nearly to the middle of the front. Face nearly perpendicular, very gently concave below the antennæ to the tubercle, thence receding to the oral margin; yellow, on the sides whitish; cheeks linear, eyes convergent below. Thorax bronze-black, moderately shining, with two very faint, slender, less shining stripes; scutellum of the same color, not infrequently somewhat reddish. Pleuræ whitish pollinose. Abdomen slender, only a little widened behind, in the male opaque black, sometimes faintly purplish, the first segment and sides of the second to beyond the middle, the narrow hind margin of the second, third, and fourth, and the remainder of the abdomen, shining, somewhat metallic; fifth segment scarcely longer than broad in both sexes; in the female the abdomen is broader throughout, shining reddish, especially on the front part of the second—fifth segments, the posterior portion more brownish or even blackish. Legs yellowish; the tip of the hind femora, and sometimes the tip of the front and middle femora, the tip of front and middle tibiæ, and nearly all of the hind pair, and all the tarsi, brown; the hind tibiæ and tarsi usually darker, nearly blackish. Wings usually dark brown, more blackish toward the stigma, with a large triangular hyaline spot near the tip, reaching from the third vein to the hind margin as far as the tip of the discal cell; the axillary angle, the anal cell, the larger part of the third posterior cell, and somewhat in the discal cell, lighter brown, sometimes wholly hyaline, with a brown band filling out the end of the discal cell (var. *fascipennis* Macq.), rarely there is a hyaline streak along the middle of the marginal cell; anterior cross-vein near middle of discal cell.

This description is chiefly based upon numerous specimens collected in the vicinity of New Haven, among which the wings vary very much in the color of the posterior border. Other specimens differing scarcely at all from the more typical ones I have from Florida and Kansas. According to Dr. Loew, his *Ocypt. longiventris* differs from *fuscipennis* in the wings being larger and the picture different, but a large number of specimens show that the coloring of the wings is variable, and, in such frail flies, the size of the wings is a doubtful character. It seems to me very probable that *Ocypt. conformis* is also a synonym of this species.

Of the synonymy of *Ocypt. fascipennis* Macq. there can be no doubt, I think. The hyalinity of the wings in extreme examples might indicate the two varieties to be "bestimmt verschieden," as Schiner thought (Novara Exped., 346, 14), but a larger number presents too many intermediate forms.

Baccha aurinota. (Plate IV, fig. 7.)

Baccha aurinota (Harris) Walker, List, etc., iii, 548.

Baccha fascipennis Wiedemann, Auss. Zw. Ins., ii, 96; v. d. Wulp. Tijdschr. voor. Entom., xxvi.

Habitat.—Connecticut, Massachusetts, Indiana!, New York, Canada.

♂. Length, 10 to 11^{mm}. Face yellow, extending up narrowly on the lower part of the front, more reddish shining in the middle; nearly perpendicular, and gently concave to the tubercle, thence much receding to the oral margin; cheeks extremely narrow, the eyes approaching the oral margin; the distance between the eyes below not two-thirds the width of the face below the antennæ. Antennæ brown, the under side of the third joint reddish yellow. Front very narrow above, separated only by the width of the ocelli at the vertex; shining black, narrowly pollinose along the eyes, above the root of each antenna a reddish yellow spot more or less confluent, leaving a rounded black spot between the roots of the antennæ above. Dorsum of thorax metallic greenish black, with three median, slender, grayish pollinose stripes; pleuræ thickly grayish pollinose and with white pile. Scutellum and the hind part of the thoracic dorsum, in the middle, shining golden. Abdomen slender, black, shining; the front part of the third and fourth segments with small, interrupted, yellowish-red, white pollinose cross-bands; posterior portion of the second, third, fourth segments, and the remainder of the abdomen, more metallic shining. Wings hyaline, the base to the humeral cross-vein, and a large quadrate spot on the middle, blackish-brown; the spot is more blackish on the stigma, brownish behind, reaching to near the middle of the third posterior cell; the tip of the costal cell is hyaline, and the tip of the sub-costal yellowish. Legs reddish or brownish yellow, the end of hind femora, the most of the hind tibiæ, and all the tarsi, brown.

Two male specimens from Connecticut, that apparently belong to this species, have the face and front metallic green, the tubercle and a lunule above the antennæ, inclosing a small black spot, yellow. They are, moreover, smaller, (9 to 10^{mm}) and the brown of the wings is much less intense.

The name *B. fascipennis* would have priority were it not so nearly identical with *B. fuscipennis* Say as to render its use highly objectionable.

Baccha lemur.

Baccha lemur Osten Sacken, Western Diptera, 331.

Habitat.—California, Wyoming, New Mexico (O. S.)!

Length, 10 to 11^{mm}. Wings hyaline, with an incomplete cross-band between the stigma and the fourth posterior cell; abdomen with two red cross-bands. Front and vertex metallic greenish black, the former (in the ♀) whitish pruinose along the eyes; face whitish pruinose, its ground color variable, dark metallic green, with more or less brownish yellow on the sides and on the facial tubercle, or entirely yellowish; antennæ brown, or reddish brown, inserted on brownish yellow ground. Thorax metallic greenish black, with vestiges of whitish pruinose stripes anteriorly; pleuræ whitish pruinose, with white pile; scutellum translucent, yellowish brown, with a metallic reflection; halteres with yellow knobs. Abdomen black, shining, with bronze and bluish reflections, a broad, blood-red cross-band, slightly emarginate in the middle posteriorly, at the base of the third and fourth segments; these cross-bands are slightly pruinose; the sides of the abdomen beset with white pile. Legs pale yellow; hind femora and tibiæ usually each with a brownish ring; sometimes the legs are more brownish, especially on the femora. Wings hyaline; the root before the humeral cross-vein and the extreme base of the second basal cells is infuscated, costal cell hyaline, but the interval between auxiliary and first veins is pale brownish; stigma dark brown, the corner between the costa and the end of first vein yellowish; a brown, incomplete cross-band between the first and fifth veins; it coalesces with the brown stigma, leaves hyaline the extreme proximal end of the submarginal cell, covers the small cross-vein and the cross-vein at the base of the discal cell, but reaches only very little beyond either, and ends at the fifth vein, filling up the proximal end of the fourth posterior cell.

Habitat.—Santa Monica, Cal., February 18; Summit Station, Sierra

Nevada, July 17; Fort Bridger, Wyo., August 4; Morino Valley, N. Mex., July 1; W. L. Carpenter. One male and three females.—Osten Sacken, l. c.

Description compared with the type specimen at Cambridge.

Baccha costata.

Baccha costata Say, J. Acad. Phil., vi, 161; Compl. Wr., ii, 357.

Habitat.—Indiana (Say).

"Body black; tergum with white bands; head silvery; a shining black line from the vertex to the mouth, much contracted on the middle of the front. Antennæ obsoletely honey-yellow at base. Occiput plumbeous with a silvery reflection. Thorax black. Poisers white. Wings hyaline with a somewhat narrow costal margin not reaching the tip. Scute margined with yellow. Tergum black; first, second, and third segments with an oblique white spot on each side at base, and remaining segments tipped with yellow-white; feet black; anterior pairs, base of the tibia, and tip of the thighs honey-yellow; posterior tibiæ honey-yellow at base. Length half an inch."—Say, l. c.

Baccha latiuscula.

Ocyptamus latiusculus Loew, Centur., vii, 68.

Habitat.—San Domingo!, Cuba (Lw.).

♂, ♀. Length, 6^{mm}. Black, moderately shining. Front shining blue-black; in the male the frontal triangle large, shining black, narrowly yellow on the sides. Face yellowish white, with a black stripe in the middle, often obsolete. Antennæ black. Abdomen rather broad, depressed, widest at tip of second segment, thence slightly narrowed; in color shining purplish black. Legs black. Wings black, towards the posterior margin less so.

Three male and one female specimens, San Domingo (G. F. Frazar.) One male specimen, which is apparently the same, has the frontal triangle nearly wholly yellow, the antennæ in large part yellowish, a small spot on the humeri and another on the post-alar callus, yellowish red, the scutellum obscurely yellow, the abdomen chiefly opaque black, with a large obscurely reddish-yellow spot on the angle in front of the second and third segments, and the four front legs chiefly luteous. It is apparently an immature specimen. Loew's specimens showed in a less degree similar differences. ("Scutellum æneo-nigrum, vel æneo-piceum. Abdomen media segmentorum singulorum parte purius nigra et magis opaca.") The species differs from *B. dimidiata* chiefly in the wings not being hyaline on the outer part.

Baccha cognata.

Baccha cognata Loew, Centur., iii, 27.

Habitat.—New York (O. S.)!

♀. Length, 7^{mm}. Blackish bronze, head concolorous, the lower half of the face and the antennæ yellow. Humeri and pleuræ yellowish.

Abdomen blackish bronze, basal fasciæ of the third and fourth segments, sometimes also of the fifth, yellow. Wings subhyaline, apical margin and the stigma smoky, the base of the latter black.

Similar to *B. obscuricornis*. Head bronze black, lower half of the face yellow; front, except a median stripe, and face, except the tubercle, thinly clothed with whitish pollen, on the occiput more thickly pollinose. Dorsum of the thorax black bronze, the humeri dilutely yellowish. Pleuræ dilutely yellowish or a little reddish, below obscurely æneacent. Scutellum of the same color as the thorax. Abdomen slender, black bronze, near the tip fuscous bronze: third and fourth segments always, fifth frequently, with a basal yellow fascia. Legs yellow or light reddish, hind femora near the tip, the tibiæ and tarsi nearly wholly, dilutely subfuscous. Wings subhyaline, lightly cinerescent, veins blackish; cross-veins lightly clouded; stigma elongate, smoky, with a basal black spot; apical margin of the wing smoky.

Translation of the original, compared with the type specimen at Cambridge.

Baccha obscuricornis.

Baccha obscuricornis Loew, Centur., iii, 26.
Baccha angusta Osten Sacken, Western Dipt., 332.

Habitat.—Sitka (Lw.), California!

♂ ♀. Length, 7^{mm}. Head bronze black, front nearly wholly, frontal triangle, and the face except the tubercle, thinly white pollinose, the occiput more thickly so. Antennæ wholly brown or black. Dorsum of thorax and scutellum bronze black. Pleuræ very pallidly testaceous, or above yellow and below subfuscous. Abdomen slender, blackish fuscous, somewhat metallic bronze, the base usually bronze black, the third and fourth segments always, the fifth frequently, with a basal yellow fascia. Legs yellow or dilutely testaceous; the hind femora near the tip, the tibiæ, and tarsi almost wholly, subfuscous. Wings subhyaline, lightly cinerescent, veins fuscous black; the transverse veins obsoletely clouded with smoky; stigma elongate, smoky, with a basal black spot; apical margin and the posterior apical half clouded smoky.

Of the synonymy of *B. angusta* there can be no doubt, and its identity with *B. elongata* of Europe seems very probable. I have only an European male for comparison, but I can find no other differences than in the color of the antennæ, which are red. Loew adds to his description: "A Baccha elongata fronte minus æquali et antennis totis atris differt"; but the third joint of the antennæ in my specimens, as in the one which Osten Sacken described, is brown or brownish, so that this difference loses much of its value, and there only remains the difference in the width of the female front. As I have no female specimen of *B. elongata* for comparison, I cannot give any opinion as to the identity of what Loew believed to be two different species.

Baccha torva, n. sp.

Habitat.—Texas!

♀. Length, 9 to 10mm. Cheeks extremely narrow; face wholly yellow. Front very narrow above, shining black, yellow on the sides below; two small, yellow spots just above the base of the antennæ. Antennæ black, third joint oval, thickened. Thorax black; humeri, a spot on the outer end of the suture, the post-alar callosities, and scutellum, yellow or luteous, the latter more brown on the disk. Abdomen elongate, shining brownish black, anterior outer part of the second-fourth segments more luteous; broadest at the tip of the second segment. Legs luteous, the hind pair blackish; hind tarsi, except the last two joints, light yellow. Wings nearly hyaline; the immediate base, the costal and subcostal cells, and a broad triangular cross-band reaching to the outer part of the sixth vein, dark brown.

One specimen, Texas (National Museum, Professor Riley's collection).

Baccha capitata.

Baccha capitata Loew, Centur., iii, 25.

Habitat.—Cuba (Loew)!

♂. Length 12mm. Fuscous-ochraceous, opaque, rather bare. Head, thoracic stripes, spots of the pleuræ, scutellum, and abdominal fasciæ, light yellowish. Hind femora and the hind tibiæ, on their distal half, fuscous. Costa of the wings rather broadly clouded with subfuscous, near the tip fuscous.

Head large, light yellow; frontal lunule fuscous-ochraceous, circumscribed with fuscous. Antennæ obscurely ochraceous. Occiput black, white pollinose, the pollen of the orbits light yellow. Dorsum of the thorax fuscous-ochraceous, opaque, with four light yellow stripes, the intermediate ones posteriorly acute and moderately abbreviated, the lateral ones broadly interrupted. Scutellum light yellow, near the tip usually fuscous-ochraceous. Pleuræ with light yellow spots, variegated with obscure ochraceous and fuscous. First segment of the abdomen yellow, with a fuscous-ochraceous posterior fascia; remainder of the abdomen fuscous-ochraceous, with ochraceous pile, clothed more thickly near the tip of the abdomen; the second segment has at its base a yellowish cross-band; third segment with a rather broad, light-yellow cross-band; fourth at its base with a narrow, saturate-yellow band. Legs ochraceous; hind femora, except the base and tip, and the distal half of the hind tibiæ, fuscous. Wings hyaline, the costal border rather broadly clouded with ochraceous-subfulvous, fuscous near the tip.

Translation from the original, compared with the type.

The stripes of the thorax and bands of the abdomen would be more properly described as light ochraceous. It is a beautiful large species, characterized especially by its general light color.

Baccha dimidiata. (Plate V, fig. 10.)

Syrphus dimidiatus Fabricius, Species Insect., ii, 434, 64; Ent. System., iv, 310, 118; Wiedemann, Auss. Zw. Ins., ii, 140, 42.
Scaeva dimiditata Fabricius, Syst. Antl., 254, 25.
Ocyptamus dimidiatus Schiner, Novara Exped., 346; Osten Sacken, Cat. Dipt.

Habitat.—West Indies! Brazil (Schiner).

♀. Length, 6mm. Front shining violet black, very narrow above, with short blackish pile. Antennæ brownish black, third joint subtriangular. Eyes much convergent below. Face yellowish white, obscurely blackish in the middle, and on the oral margin; sometimes wholly yellowish white and extending up on the sides of the front below. Thorax shining brownish black; pleuræ whitish pollinose. Abdomen bare, deep shining, somewhat metallic brown, only a little elongate, not reaching to the tip of the wings, broadest at tip of second segment, thence gently narrowed to the tip of the fifth segment. Venter obscurely brownish yellow. Legs blackish brown. Wings blackish brown on the basal half, hyaline on the outer portion; the border of the brown extends across nearly straight from before the tip of the first longitudinal vein to the tip of the sixth.

Four specimens, San Domingo (G. F. Frazar).

ADDITIONAL NORTH AMERICAN SPECIES.

Baccha clavata Fabricius, Syst. Antl., 200, 3; Wiedemann, Auss. Zw. Ins., ii, 94, 4; Schiner, Novara Exped., 341. S. Am. (Schiner); W. Indies (O. S.).
Syrphus clavatus Fabricius, Ent. Syst., iv, 298, 73.
Baccha cochenillivora Guerin, Rev. Zool., 1848, 350; Bull. Soc. Ent., 1848. Guatam.
Baccha conformis.
Ocyptamus conformis Loew, Centur., vii, 67. Cuba.
Baccha cubensis Macquart, Dipt. Exot., 4e Suppl., 161, 5. Cuba.
Baccha cylindrica Fabricius, Syst. Antl., 199, 2; Wiedemann, A. Z., ii, 92.
Syrphus cylindricus Fabricius, Spec. Insect., ii, 249, 41; Ent. Syst., iv, 298, 74.
Baccha fasciata Röder, Stett. Ent. Zeit., 1885, 342. Porto Rico.
Baccha fraterna Bigot, Ann. Soc. Ent. de Fr., 1883, 324 (*Ocyptamus*). Mexico.
Baccha funebris.
Ocyptamus funebris Macquart, Hist. Nat. Dipt., i, 554, 1; Dipt. Exot., ii, 105; Bigot in Ramon de la Sagra, etc., 807; Schiner Novara Exped., 346 ("Ob sie mit Macquart's Ocyptamus fascipennis [B. fuscipennis] identisch ist, vermag ich nicht zu entscheiden.")
Baccha infuscata Bigot, Ann. Soc. Ent de Fr., 1883, 324 (*Ocyptamus*). Mexico.
Baccha lineata Macquart, Dipt. Exot., 1er suppl., 139, 4; pl. 20, fig. 5. Yucatan, Texas?
Baccha luctuosa Bigot, Ann. Soc. Ent. de Fr., 1883, 334. Mexico.
Baccha marmorata Bigot, Ann. Soc. Ent. de Fr., 1883, 333. Mexico.
Baccha notata Loew, Centur., vii, 65. Cuba.
Baccha parvicornis Loew, Wien. Ent. Monats. v, 41; Centur., vii, 64. Cuba.
Baccha rufiventris Bigot, Ann. Soc. Ent. de Fr., 1883, 325 (*Ocyptamus*). Cuba. [=*B. dimidiata*?]
Baccha scutellata Loew, Centur., vii, 69 (*Ocyptamus*). Cuba.

CHALCOMYIA.*

Chalcomyia Williston, Bull. Brooklyn Entom. Soc., vol. vii, p. 133.

Moderate sized, nearly bare, metallic bronze species. Eyes bare, broadly separated in the male. Antennæ situated upon a strong conical projection, especially in the male, first two joints short, third orbicular; arista basal, bare. Face in the male gently convex from below the antennal process; in the female concave from the antennæ to the tip, but most so below the middle; face produced but little below the eyes. Scutellum large and projecting, nearly square, with the outer angles rounded, thinned on the margin, and shallowly grooved on the disk. Abdomen flattened, broadly oval in outline. Legs rather stout; hind femora moderately thickened; hind tibiæ gently arcuate; hind metatarsi as long as the four following joints, not thickened. Marginal cell of wing open, third longitudinal vein nearly straight, anterior crossvein oblique, situated a little before the middle of the discal cell. Type of genus *C. aerea* Loew, North America.

Chalcomyia aerea. (Plate IV, fig. 14.)

Myiolepta aerea Loew, Centur., x, 53.

Habitat.—Virginia! Illinois (Lw.).

♂, ♀. Length, 6 to 7^{mm}. Greenish bronze-color, shining, clothed with short yellow pile. Front of the female with a whitish pollinose cross-band, narrowly interrupted; male with a narrow, obsolete cross-band, extending narrowly down along the eyes. Margin of the antennal process at the base of the antennæ red. First two joints of the antennæ reddish-brownish, third joint more brownish-reddish, blackish on the upper part; arista luteous. Face in the female shining black, except a yellowish pollinose stripe that runs from the eyes obliquely to the oral margin; in the male the sides of the antennal process and the face below the process thickly covered with satiny yellowish pubescence, when viewed from above, wholly concealing the ground color, and changeable in different lights, the under side of the process showing the ground-color more distinctly. Anterior margin of the thorax white pollinose. Abdomen more bronze-colored, with yellow pile, longer on the sides in front. Legs black, extreme tip of the femora, basal third of the tibiæ, and first three joints of the tarsi reddish-yellow; hind femora in the male a little more thickened than in the female and with a slight protuberance below near the base. Wings sublutescent, the veins near the tip and posterior margin fuscous.

Two specimens. Virginia (Mr. Theo. Pergande).

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* *Χαλκος*, copper, and *μυια*, fly.

MYIOLEPTA.[*]

Myolepta Newman, Ent. Mag., v, 373, 1838.
Xyloteja Rondani, Dipt. Ital. Prodr., ii, 96, 1857.

Moderate sized, bare species, metallic, black, or black-green; on the abdomen and face, sometimes with luteous side spots. Head broad, a little flattened. Antennæ short, situated upon an obtuse conical projection; first two joints short, third rounded or oval, with a basal, bare arista. Face strongly concave in outline below the antennæ, projecting below, in the male with a tubercle near the middle. Eyes bare, contiguous in the male; the front somewhat narrowed behind in the female. Thorax somewhat narrowed in front. Scutellum black, thinned near its border. Abdomen about twice as long as the thorax, and as broad or broader, somewhat flattened, oval or ovate. Legs stout, all the femora somewhat thickened, but more especially so the hind pair. Marginal cell of the wings open; third longitudinal vein nearly straight; anterior cross-vein towards the base of the discal cell.

Type of genus, *M. luteola* Gmelin.

TABLE OF SPECIES.

1.—	Face on the sides below with a large luteous spot; third joint of antennæ ovate	**strigilata**
	Face without such spot	2
2.—	Legs wholly black	**bella**
	Tarsi and tibiæ more or less yellow	3
3.—	Abdomen black	**nigra**
	Abdomen with luteous or yellow spots at the base	**varipes**

Myiolepta strigilata.

Myiolepta strigilata Loew, Centur., x, 54.

Habitat.—Texas, North Carolina!

♂, ♀. Blackish greenish, moderately shining, wholly clothed with short, rigid, appressed white pile; antennæ, tibiæ, base of front tarsi, and hind tarsi except the last two joints, red ferruginous; third joint of the antennæ ovate. Length of body, 6 to 7$^{\mathrm{mm}}$; of wings, 5 to 6$^{\mathrm{mm}}$.

Black-green, moderately shining, clothed with short, rigid, appressed white pile. Vertex of the male black, shining; front and face clothed very thickly, with dilutely lutescent pollen, a bare spot, however, above the antennæ; facial tubercle and cheeks black and shining, lower part of the face on each side with a very large luteous spot. Front and face of the female black and shining, the latter on the lower half on each side with an oblique luteous spot; these spots and a bisinuate fascia situated below the antennæ whitish or sublutescent pollinose; the remainder of the face not pollinose. Antennæ ferruginous-red, near the base more saturately tinged, third joint ovate, the arista concolorous. Venter cinereous, with white pollen and briefly white pilose. Femora black, the extreme tip reddish luteous; tibiæ ferruginous red, near the base becoming more luteous, anterior ones blackish near the tip, hind ones fuscous in the middle; front tarsi black, near the base red, hind ones red, last two joints black. Wings very dilutely lutescent, but near the tip cinereous and marked with a median fascia more obsoletely cinerescent.

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[*] *Μυια*, fly, and *λέπτα*, fine.

Translation from the original, compared with the type specimens (three) in the Museum of Comparative Zoology. In the single male specimen the appressed pile of the dorsum has a more yellowish cast.

Myiolepta bella (Plate V, fig. 2).

Myiolepta bella Williston, Trans. Amer. Phil. Soc., xx, 308.

Habitat.—Washington Territory, Oregon!

♀. Length, 7 to 8mm. Deep black, shining. Front with very short black pile above, not at all pollinose; face bare, not pollinose, much produced, in profile deeply concave, below the middle briefly and gently convex. First two joints of the antennæ blackish, third joint orbicular, reddish yellow; arista brownish luteous. Thorax faintly whitish pollinose on the anterior margin; clothed with very short black pile, longer on the border of the scutellum. Abdomen broadly oval, very shining, clothed with short white pile. Halteres light yellow; tegulæ white. Legs black, with black pile. Wings lightly tinged with brown on outer part, hyaline on basal portion; stigma light brown.

Three specimens, Washington Territory, Mount Hood, Oregon.

Myiolepta varipes (Plate V, figs. 1, 1*a*, 1*b*).

Myiolepta varipes Loew, Centur., ix, 79; Williston, Trans. Amer. Phil. Soc., xx, 308.

Myolepta lunulata Bigot, Annales Soc. Ent. Fr., 1884, 537.

Habitat.—Virginia, Washington Territory, California!

♂, ♀. Length, 7 to 8mm. Black, shining. Front in female narrowly pollinose along the orbit on each side; in the male the frontal triangle pollinose on its margins. Antennæ brownish reddish, in some specimens more distinctly brown throughout; basal joints more blackish, the arista like the third joint. Face in the female in profile deeply concave from the base of the antennæ to a little above the oral margin; shining, with a broad, white pollinose cross-band below the antennæ; the sides, and a stripe running from the eye toward the oral margin, pollinose; face in the male deeply concave to a little below the middle, where there is a small but prominent mammillate tubercle, everywhere densely white pollinose, except on the tubercle and immediately below it and on the cheeks, where it is shining; the lower part of the face in both sexes not so much produced as in the allied species. Dorsum of thorax with a bronze reflection, clothed with short, appressed, yellowish white pile; on the front margin, interrupted in the middle, white pollinose. Scutellum shining black, with yellowish pile. Abdomen black; the first segment narrowly yellowish on the sides; the second segment with a large, oval, yellowish spot on each side, extending rather further back in the male, and sometimes narrowly bordered on the sides behind with black; pile short, appressed, nearly white. Legs black, extreme tip of all the femora, basal third of all the tibiæ and more or less of the tip, and the first three joints of the middle and hind tibiæ, luteous or yellow. Wings cinerous hyaline, toward the base yellow, in the middle in front with a large subfuscous spot; distal part of the wings distinctly brownish tinged.

Three female specimens from Washington Territory and California and one male from Virginia (Pergande).

Myiolepta nigra. (Plate IV, fig. 15.)

Myiolepta nigra Loew, Centur., x, 52.

Habitat.—Pennsylvania (Lw.), New York, North Carolina!

♀. Length, 7 to 8.5^{mm}. Black, shining, wholly short white pilose. Front shining, on each side near the eyes narrowly white pollinose. Antennæ brownish red, the first joint black; third joint orbicular; arista luteous. Face strongly concave in profile, the lower part considerably produced; across below the base of the antennæ, and a narrow stripe on each side running from the eye to the oral margin, white pollinose. Front margin of the thorax lightly whitish pollinose. Legs black, the first three joints of the middle and hind tarsi light yellow. Wings dilutely yellowish, near the base hyaline, on outer part faintly blackish. Halteres dilutely yellow; tegulæ white.

One specimen, from Professor J. A. Lintner.

RHINGIA.

Rhingia Scopoli, Entom. Carniolica, 358, 1763.

Moderately large, plump, bare species. The abdomen with yellowish-red markings. Head hemispherical, flat behind, somewhat broader than the thorax. Antennæ short, third joint short, oval, with bare arista. Proboscis long, slender, divergent at the tip. Face small, yellowish, without tubercle below, produced into a long, slender snout-like epistoma, under which the proboscis, when at rest, lies ensheathed. Eyes naked, contiguous in the male. Thorax not very long. Scutellum translucent-yellowish. Abdomen broader than thorax, not much longer, oval, arched. Legs slender, femora not thickened; hind metatarsi long, somewhat thickened. Marginal cell of wings open, third longitudinal vein gently convex anteriorly, joining the costa beyond the tip of the wing, anterior cross-vein toward the base of the discal cell, slightly oblique. Type of genus, *R. rostrata* Linné, Europe.

A well-marked genus; in the United States so far represented only by a single species, which occurs in the Atlantic States, in abundance on low vegetation near brooks and in meadowlands.

Rhingia nasica. (Plate V, fig. 3, 3*a*.)

Rhingia nasica Say, J. Acad., Phil., iii, 94; Compl. Wr., ii, 81; Wiedemann, Auss. Zw. Ins., ii, 115, 1.

Habitat.—Atlantic States, Indiana, Kentucky!

♂, ♀. Length, 8^{mm}. Frontal triangle small, blackish; front in female black, lightly whitish dusted, pile short, black. Antennæ yellowish-red, third joint cordate in outline, a little larger in the female. Face red, more or less brownish on the cheeks. Thorax shining black, with two broad, whitish pollinose, dorsal stripes; pile black, very short in the female. Scutellum in the female wholly translucent, amber-colored, with very short pile, except a row of black bristles on the border; in the male largely blackish at the base, the pile longer, black, and with a row of black hairs on its border. Abdomen black, with two pairs of large yellow or reddish spots on the second and third segments; the first segment in large part obscure yellow. The black of the second and third segments opaque, fourth segment wholly shining greenish-black; pile orange or yellow; the female with less, nearly bare, except on the second segment. Venter light yellow on basal portion. Legs in large part brownish-yellow; femora black, a ring on the tibiæ, and the posterior metatarsi brown. Wings with a strong yellowish or brownish tinge.

Numerous specimens; New England, Indiana (Coquillett), Kentucky.

EUGENIAMYIA.*

Eugeniamyia Williston, Canada Entomologist, xiv, 80, 1882; Proc. Am. Phil. Soc., xx, 309.

♂. Rather large, dark ferruginous red species, nearly bare, with short hairs. Head narrower than the thorax. Eyes bare, contiguous. Antennæ situated below the middle of the eyes in profile, short, third joint short and quadrate; arista basal, plumose. Posterior orbits swollen. Face much produced downwards and forwards, somewhat conical, truncate, with an obtuse, prominent tubercle in the middle. Thorax longer than broad; in front and above the root of the wings, the post-alar callosities, and on the border of the scutellum, with strong bristles. Abdomen elongate, nearly twice the length of the thorax, of nearly equal width throughout, narrower than the thorax. Femora all swollen, and with short bristles below, hind femora more swollen and elongate, and the spurs stouter, tibiæ with a circlet of short spines at the tip, the hind pair with short spines scattered irregularly over their outer surface. Wings as in *Brachyopa*, the first posterior cell long petiolate. Type of genus *E. ferruginea* Fallen, Europe and North America.

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* *Ευγένεια*, goodness of its kind, and *μυια*, fly.

Eugeniamyia ferruginea. (Plate V, figs. 4, 4*a*, 4*b*.)

Rhingia ferruginea Fallen, Dipt. Suec. Syrph., 34, 3 (1816).
Brachyopa ferruginea Meigen, Syst. Beschr., iii, 263, 4; Zetterstedt, Dipt. Scand., ii, 686, and viii, 3125, 1; Schiner, Verh. Zool. Bot. Gesellsch., vii, 376; id., Fauna Aust., i, 326; Osten Sacken, Cat. Dipt., 128.
Eugeniamyia rufa Williston, Can. Entom., xiv, 80.

Habitat.—Washington Territory, Manitoba!, Northern Europe.

♂. Length, 14mm, of wings 10mm. Dark ferruginous-red. Head and antennæ shining yellowish-red, arista black, red at base. Face on the sides with a stripe of silvery pollen, not very conspicuous. Dorsum of thorax darker, almost brownish-red, with two rather broad pollinose stripes, abbreviated behind, and inclosing in front a black spot not reaching the suture; clothed with rather abundant short black hairs, and the bristles of the same color. Pleuræ with sparse yellowish pile; metanotum blackish behind. Abdomen narrower than the thorax and much longer, nearly bare, shining, somewhat brownish near the end. Basal joints of tarsi yellowish, the last one or two joints brownish; femora below near the base, especially on the middle pair, with tufts of yellow pile; the short black bristles of the femora more abundant on the under sides and near the ends, also on the outer sides of the posterior tibiæ. Wings brownish in front, lighter behind, base of marginal cell, as far as tip of the auxiliary vein, with a hyaline streak.

One specimen.

This species is recorded by Loew from Manitoba (vide O. Sacken's Catalogue, p. 128), and, upon further study, I am convinced that the species which I described as *E. rufa* must be the same.

An examination of the specimen identified as this species in the Loew type collection, since the foregoing was written, confirms this determination.

BRACHYOPA.*

Brachyopa Meigen, Syst. Beschr., iii, 260, 1822.
Exochila Rondani, Atti d. Soc. Ital. d. Sc. Nat., xi, 1868.

Moderately large, nearly bare species, of prevailing reddish-yellow, sometimes brownish color. Head somewhat narrower than the thorax. Antennæ short, third joint round or oval; arista basal, bare or pubescent. Face concave, without tubercle, subcarinate, produced downwards and forwards considerably below the eyes, truncate at tip. Eyes bare, contiguous in the male, front in female narrowed above, the distance from vertex to antennæ greater than thence to oral margin. Thorax narrowed in front. Scutellum large. Abdomen considerably broader than the thorax and scarcely longer, broadly oval. Legs simple, rather strong, the hind femora somewhat elongate, and some times with short bristly hairs below. Wings much longer than the abdomen;

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*Βραχὺς, short, ὤψ, face.

third longitudinal vein straight, anterior cross-vein before the middle of the discal cell. Types of genus, *B. conica* (Panzer) and *B. bicolor* (Fallen), Europe.

TABLE OF SPECIES.

1.—Arista bare **2**
Arista pubescent (*Exochila*) . . . . **notata**
2.—Face and front brownish, covered with grayish pollen; abdomen mostly brown . . . . **vacua**
Face reddish-yellow, shining except a pollinose band below the antennæ; front of female on upper two-thirds blackish. Abdomen reddish-yellow with slender brown incisures . . . . **media**

Brachyopa notata. (Plate V, figs. 5, 6.)

Brachyopa notata Osten Sacken, Bull. Buff. Soc. Nat. Sci. iii, 68; Cat. Dipt., 248; Williston, Proc. Am. Phil. Soc., xx, 308.

Habitat.—White Mountains, Mount Hood, Washington Territory!

♂, ♀. Length, 6^{mm}. Head light yellow, with faint silvery pollen, and, on the front, with very short white pile. Antennæ a little more reddish, the arista reddish-brown, with rather long pubescence. On the cheeks in front a faint brownish stripe running from the eye. Thorax ochraceous, with short dusky pile; in the middle above a slender, and on each side a broad, whitish dusted stripe. Scutellum reddish-yellow, nearly as long as broad, triangular in outline, with the apex rounded; the pile black. Abdomen brownish-yellow, the segments with narrow, but distinct, dark brown posterior borders, and, in the middle, with a slender brown stripe, more or less interrupted before each transverse fascia, sometimes only showing a brown spot on each segment, wanting on the fourth. Legs reddish-yellow; the base and tip of the hind tibiæ, and the hind tarsi, reddish, on the latter more or less brownish. Wings somewhat tinged with brownish-yellow, distinctly brownish at the tip and along the last section of the fourth vein and the posterior cross-vein; stigma brownish, posterior cross-vein only a little longer than the penultimate section of the fourth vein, the including angle nearly rectangular.

Two female specimens from Mount Washington, N. H. (Dr. George Dimmock, No. 1490), and two from Mount Hood, Oregon, and Washington Territory, both males. The latter two specimens show no differences whatever, that I can see, except that the color is a little darker. The last two joints of the four front tarsi in all are brown.

Brachyopa media. (Plate V, fig. 7.)

Brachyopa media Williston, Proc. Amer. Phil. Soc., xx, 308.

Habitat.—Kern County, California!

♀. Length, 6 to 7^{mm}. Face and lower third of front reddish-yellow, shining, except across below the antennæ, where there is a band of silvery pollen; cheeks with an oblique, slender, brownish stripe. Antennæ reddish-yellow, third joint large; arista yellowish-brown, bare.

Front divergent on the sides below, on the upper two-thirds black, covered with whitish pollen. Thorax black, thickly covered with whitish pollen, in the middle in front with two black linear stripes; humeri, post-alar callosities, and the scutellum, yellowish-red, the last rounded, much broader than long. Pleuræ dark, thickly whitish dusted, a black spot above the middle and hind coxæ. Abdomen reddish-yellow, with slender brownish hind borders on the second, third, and fourth segments. Legs brownish-yellow, the last two joints of all the tarsi blackish; hind tibiæ, and basal joints of hind tarsi, brownish. Wings nearly hyaline, faintly clouded at the tip; stigma yellowish; posterior cross-vein not much longer than the penultimate section of the fourth vein, the included angle obtuse.

One specimen (H. K. Morrison). This species is allied to *B. bicolor* of Europe, but differs from a single specimen I have for comparison, as well as the description, in the front being broader below, and black above, in the tarsi, etc.

Brachyopa vacua.

Brachyopa vacua Osten Sacken, Bull. Buff. Soc. Nat. Sci. iii, 68 (by typographical error *racua*); id., Cat. Dipt., 247; Williston, Proc. Am. Phil. Soc., xx, 308.

Brachyopa cinereo-vittata Bigot, Annales Soc. Ent. de France, 1884, 537.

Habitat.—Canada, California!

"♀. Length, 8 to 9^{mm}. Brownish-gray, thorax with three brown stripes; abdomen brown, its basal third whitish-yellow, with a brown line in the middle; arista bare.

Face, front and vertex, densely clothed with a grayish pollen; lower part of the face very much projecting; a brownish stripe runs across the cheeks from the eye to the mouth; antennae brownish, grayish pollinose, arista bare, brownish-reddish at base. Thoracic dorsum yellowish-gray, with three brown stripes, the intermediate one geminate and abbreviate posteriorly. Scutellum brownish-yellow. Abdomen brown, shining; first and second segments whitish-yellow (as if translucent), the second brown posteriorly and with a longitudinal brown line in the middle. Legs grayish-brown, hind femora slightly incrassate, on the under side with a brush of short, spine-like bristles. Wings distinctly tinged with brownish, especially on the distal half, anteriorly; first posterior cell distinctly petiolate at the distal end, the petiole being equal in length to the small cross-vein.

"*Habitat.*—Quebec, Canada (Mr. F. X. Belanger), a single male specimen. The interval between the distal ends of first posterior and discal cells is a shallow sinus, and not a right angle as in *B. notata.*"—Osten Sacken, l. c.

A single female specimen from Kern County, California, I have scarcely a doubt belongs here; the differences from the description are very slight. The color throughout is apparently a little darker, and the legs are rather reddish than grayish brown. I do not see that the lower part of the face projects more than in *B. notata*. The third joint of the antennae is distinctly smaller than that of the females of either of the preceding species.

VOLUCELLA.*

Volucella Geoffroy, Hist. des Insects de Environs de Paris, vii, 1764.

Cenogaster Dumeril, Exposition, etc., 1801, and Dict. d'Hist. Natur. Strasburg, 1817.

Temnocera St. Fargeau and Serville, Encycl. Meth., x, 786, 1825; Macquart, Dipt. Exot., ii, 2, 26.

Ornidia St. Fargeau and Serville, Encycl. Meth., x, 786, 1825.

Atemnocera Bigot, Bullet. bi-mens. Soc. Ent. France, No. 12, 1882.

Medium to large size, robust, sometimes thickly pilose, black, metallic blue, brownish-yellow with darker abdominal fasciæ, or nearly wholly yellowish species. Head somewhat broader than the thorax, the posterior orbits narrow. Antennæ comparatively small, first two joints short, of nearly equal length, third joint elongate, sometimes slender, often narrowed in its middle or toward the end; arista plumose, sometimes with long and abundant pile, at other times shorter, sparser. Face more or less excavated below the antennæ, with a prominence below the middle, at other times straight or convex in profile, the epistoma considerably produced downwards and somewhat forwards, conical, pointed at the tip, with a small notch. Eyes pilose, sometimes bare in the female, contiguous above in the male. Thorax sometimes with yellow lateral stripes, sometimes densely pilose. Scutellum large, often translucent, sometimes with hairs or distinct bristles on its border. Abdomen oval, strongly arched, not very much longer than the thorax. Legs simple, moderately strong, all the femora of nearly equal length. Wings large and broad, marginal cell closed, anterior cross-vein usually towards the base of the discal cell and rectangular, sometimes near the middle and oblique. Third longitudinal vein not bent into the first posterior cell, fourth vein bent inwards at the end, the third vein beyond the union directed obliquely forward; calyptræ large.

The face in the female frequently differs in profile somewhat from that of the male, the depression below the antennæ being a little greater, and the lower part of the face more receding; the third joint of the antennæ, also, is sometimes more expanded, especially at the base.

Contrary to the opinion of some excellent dipterologists I have rejected the genus *Temnocera*, for the following reasons: In several of the species of our fauna, bristles or bristly hairs exist on the scutellum and post-alar callosities. In some of these, to separate them generically would be absurd, for the conformation and coloration throughout are strikingly similar to those of others without. Moreover, the bristles in some are so fine that they are with difficulty distinguished. Hence

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*Diminutive from *volucer*, swift.

I think that this character is of but little value to distinguish our species. The other character used for this genus is of less value still: I mean the excision of the third joint of the antennæ above, as such excision in a less degree is found in most of the Volucellæ. Mr. Bigot has established the genus *Atemnocera* on the presence of bristles on the scutellum alone, the third joint of the antennæ not being excised above. If the small difference that is thus left as the sole character for *Temnocera* were made a criterion by which to base other genera in this family, how many would there be?

TABLE OF SPECIES.

1.—Thorax and abdomen very thickly furry, more or less yellowish, pilose. Face much excavated below the antennæ; arista very long and densely plumose; second segment of the abdomen yellow on the sides; wings with a dark brown spot; large species 2

Thorax and abdomen not thickly pilose 3

2.—Face black or chestnut; yellow pilose; dorsum of thorax and pleuræ wholly yellow pilose . . . . **evecta**

Face yellow; thickly yellow pilose; cheeks black; dorsum of thorax and pleuræ black pilose. . . . . **facialis**

3.—Deep black, green, violet, or coppery colored species; cheeks not light colored . 4

Prevailing color light; cheeks yellowish, wholly so or with a black stripe . 9

4.—Base of wings yellow; face light yellow, with yellow pile; sides of thorax and the scutellum reddish or yellowish; basal two-thirds of tibiæ reddish yellow . . . . **vesiculosa**, **eugenia**.

Base of wings not yellow but hyaline or brown 5

5.—Wings hyaline, except a spot at end of auxiliary vein and on the cross-veins; body wholly deep colored except, sometimes, the head 6

Wings more or less dark brown on the basal part in front 8

6.—Face much produced downward into an acute cone; third joint of antennæ elongate as usual 7

Face obtuse below, not produced downward, in the middle with an obtuse tubercle; third joint of antennæ very short, triangular . . . . **obesa**

7.—Face and front wholly black . . . . **Comstocki**

Face and front, except the cheeks, deep reddish-yellow . . . . . . **victoria**

8.—Wings broadly deep brown at the base, ending abruptly near the tip of auxiliary, and thence yellowish along the costa; abdomen clothed chiefly with short erect hairs; face considerably excavated below the antennæ . **mexicana**

Wings brown in the costal and subcostal cells; face more or less red, lightly excavated below the antennæ . . . . **anna**

9.—Third joint of antennæ deeply excised above; face produced forwards below **Hagii**

Third joint of antennæ not, or but little, excised above; face produced downward, as usual. 10

10.—Large species ($11^{mm}+$) 11

Smaller species 13

11.—Face and cheeks wholly yellow . . . . **megacephala**

Face and cheeks not wholly yellow 12

12.—Cheeks black, shining; black of the abdominal segments prolonged in the middle anteriorly (11-12^{mm}) . . . . **avida**

Cheeks yellow with a rather narrow brown or black stripe; black of the abdominal segments less distinct in the middle . . . . **isabellina**

13.—Second vein near the tip regular, *i. e.*, is not bent into the submarginal cell; face and cheeks without black stripes; wings hyaline, with a faint brown spot at the tip of the auxiliary vein 14

Second vein irregular near the end, bent into the submarginal cell 15

14.—Abdomen resplendent coppery blue, the base yellow or translucent, **vesiculosa**

Abdomen mostly yellow, brownish toward the tip, with three pairs of small quadrangular spots on the sides . . . . **sexpunctata**

15.—Face yellow; wings hyaline with brown spots 16

Face with a black stripe; wings subfasciate. 17

16.—Spots of wings distinct; black abdominal fasciæ obsolete in the middle . **tau**

Spots of the wings less conspicuous; black abdominal fasciæ complete. . **satur**

17.—Wings distinctly fasciate with brown; pleuræ with two yellow spots; yellow bands of abdomen interrupted . . . . **pusilla**

Wings less distinctly fasciate; pleuræ with five or six yellow spots; yellow abdominal bands entire . . . . **fasciata**

For other species see descriptions.

Volucella evecta. (Plate VI, figs. 6, 6*a*.)

Volucella evecta Walker, Dipt. Saunders., 251.

Volucella plumata Macquart (non Fabr.), Dipt. Exot., 4e Suppl., 131.

Habitat.—New England, Middle States, British Possessions!

♂, ♀. Length, 12 to 15^{mm}. Face black, or pitchy black, clothed with moderately abundant yellow pile on the lower two-thirds, considerably excavated below the antennæ and with a distinct broad protuberance near the middle; in the male produced directly downwards; in the female more rounded on the lower part and projecting rather more forward. Third joint of antennæ a little broader at the base, reddish-yellow or reddish-brown, black at the base; arista more than twice the length of the antennæ; long and abundantly feathery plumose with delicate pile. Front in female rather narrow, clothed with yellow pile; yellowish on the sides, with a blackish median stripe; frontal triangle in the male small. Eyes bare in female, or at most only sparsely pilose near the top, thickly pilose in male. Thorax black, shining, very abundantly light yellow pilose on the sides of the dorsum; pleuræ and scutellum less abundantly pilose in the middle, where the ground color shines through. Scutellum light yellow. Abdomen black, shining; on the sides of the second segment with a large triangular yellow spot; thickly covered with yellow pile, which is less abundant in the middle of the segment; elsewhere the abdomen is thickly covered with erect black pile, except rarely in some specimens (var. *sanguinea*, new) the posterior portion of the third and the remaining segments is clothed with longer, erect, bright red or yellow pile. Legs black; the tip of the femora and basal and terminal portions of the tibiæ, and all the tarsi, reddish. Wings brownish-hyaline, clouded along the veins; a large spot opposite the tip of auxiliary reaching to the fourth vein. Anterior cross-vein nearly rectangular, situated near the proximal third of the discal cell.

Fifty specimens.

This species is related closely to *V. bombylans* of Europe, the variety *sanguinea* corresponding to var. *haemorrhoidalis*. The species, however, shows a structural difference in the facial profile, the excavation being less below the antennæ.

Volucella facialis.

Volucella facialis Williston, Proc. Am. Phil. Soc., xx, 316.

Habitat.—California!

♂, ♀. Length, 14 to 15mm. In structure precisely like the preceding and corresponding in markings to *V. bombylans*, var. *plumata* of Europe. That it may only be a variety of *evecta* I am not prepared to deny; certainly greater differences exist among the varieties of *V. bombylans*.

Face broadly yellow in the middle, and thickly clothed with yellow pile; the eyes of the female more pilose, the dorsum of the thorax and the pleuræ black pilose, otherwise not differing from *V. evecta sanguinea*.

Volucella esuriens mexicana. (Plate VI, figs. 5, 5*a*.)

Syrphus esuriens Fabricius, System Entom., iv, 281, 10; Syst. Antl., 226, 9.

Volucella esuriens Wiedemann, Auss. Zw. Ins., ii, 197, 4; Schiner, Novara Exped., ii, 1, B. Dipt., 356, 54.

Volucella mexicana Macquart, Dipt. Exot., ii, 2, 25; tab. 5, fig. 3; Schiner, *l. c.*, 55; Osten Sacken, West. Dipt., 332.

Volucella dispar Macquart, Dipt. Exot. 1er Suppl., 123; tab. xi, fig. 2; Schiner, *l. c.*

Volucella metallifera Walker, List, etc., iii, 636.

Volucella Maximiliani Jaennicke, Neue Exot. Dipt., 87; Schiner, *l. c.*

Habitat.—California, Arizona, Florida!, Mexico (Macq.), New Granada (Macq.).

♂, ♀. Length, 16 to 19mm. Face deep chestnut-black, moderately shining, considerably excavated below the antennæ, with a rounded protuberance near the middle, below this perceptibly concave, produced directly downward into a conical tip, slightly notched at the extremity; clothed with short white pile; cheeks shining black. Antennæ varying from a dark reddish to a quite black, or sometimes the tip only reddish; third joint rather short, expanded at the base; arista moderately plumose, on the upper side longer than below. Front in female narrow above, gently convex, with yellowish pile, more black at the vertex or sometimes the pile may be wholly blackish; on each side there is a well marked concentric groove. Eyes in both sexes obscurely yellowish pilose. Thorax deep bluish-black, sometimes with a slight coppery luster; clothed with black pile, at times obscurely yellowish in front. Scutellum deep chestnut-black. Abdomen a deep resplendent violet or purplish, sometimes with a coppery luster, clothed with short stiff bristle-like hairs and on the last two segments with black pile. Legs black, with black pile. Wings hyaline; on the basal portion to a little beyond the tip of the auxiliary vein, brownish black; the end is cut off squarely and, beyond, the subcostal cell is saturate yellow, extending somewhat outwards; the dark color extends backward to beyond the fourth vein, clouding the cross-veins; the outer part of the first vein and the tip of the auxiliary are yellow.

Schiner (*l. c.*) compared the type of *Maximiliani* Jaen., and asserted it to be the same as *mexicana*, and, moreover, that both this and *dispar* Macq. were varieties of *esuriens* Fab. Structurally they are all alike, but the color in *esuriens* is more brownish. I have examined a large number of specimens from California (Coquillett), Arizona (Comstock), Texas, and Florida (Riley), and find them all quite uniform in coloration, hence it seems to be advisable to retain the varietal name.

Volucella Comstocki, n. sp. (Plate VI, fig. 9.)

Habitat.—Arizona, New Mexico!

♂, ♀. Length, 12mm. Face nearly perpendicular in profile, scarcely at all excavated below the antennæ, shining bluish-black, with long, rather abundant, black pile; front like the face, with black pile, sides nearly parallel; frontal triangle prominent, with longer black pile. Antennæ brownish-black, the third joint in the male only a little narrowed beyond the middle, the basal portion scarcely half as wide again, in the female twice as wide as on its narrowest part; arista but little longer than the joint, loosely plumose. Eyes thickly pilose. Thorax deep shining blackish blue, with rather abundant, moderately long, black pile. Scutellum deep chestnut on its disk, with black pile. Abdomen brilliant dark blue, with short black pile, longer on the terminal segments. Legs black, black pilose. Wings hyaline with a small brown spot at the tip of the auxiliary vein, faintly clouded on the outer part and posterior border.

Two specimens from Arizona (Professor Comstock), and one from New Mexico (G. F. Gaumer).

Volucella Anna, n. sp. (Plate VI, fig. 8.)

Habitat.—Arizona!

♂. Length, 14mm. Face chestnut-colored, shining bluish-black on its lower part and on the cheeks, below the antennæ faintly dusted with white; sub-antennal excavation slight, the convexity of the middle not prominent, but greater than in *V. Comstocki*. Antennæ red, third joint moderately expanded near the base. Eyes pilose with rather short pile. Thorax deep shining bluish-black, with black pile. Scutellum chestnut-colored on its upper surface, with black pile and a row of black bristly hairs on its border. Abdomen deep blue, with a coppery reflection, clothed with short black pile, longer on the posterior segments. Legs black. Wings hyaline, costal and subcostal cells brown, nearly black at the base; a small blackish spot at the tip of the auxiliary vein, a narrow brown cloud on the furcation of the second and third veins, the anterior cross-vein and cross-veins at base of discal and posterior cells.

One specimen.

Volucella eugenia, n. sp. (Plate VI, fig. 10.)

Habitat.—Bahamas, Florida!

♀. Length, 14^{mm}. Front and face light yellow, clothed with light yellow pile; cheeks deep shining black. Face considerably excavated below the antennæ, and with a rather large protuberance near the middle, much produced directly downward to a very acute tip. Antennæ yellow, third joint a little broadened at the distal end, much excised on its upper border near the middle; arista a little longer than the joint, moderately pilose. Eyes pilose. Dorsum of thorax olive-greenish-black, somewhat chestnut or even yellowish on the sides; clothed with short, rather sparse, pile, intermingled with yellowish on the humeri; along the dorso-pleural suture with short bristles, longer and more abundant on the post-alar callosities. Scutellum black at the base, becoming reddish on its border, yellowish below; along the border there is a row of black bristles. Abdomen brilliant violet, clothed with abundant, short black pile. Legs black; all the tibiæ, except the terminal fourth or third on the hind pair, yellowish red. Wings hyaline, cross-veins narrowly clouded with brown, the auxiliary vein and nearly all the first, the second, third, and fourth to near the cross-veins, conspicuously yellowish, the intervening cells tinged with the same color.

Two specimens. Is nearest allied to *V. abdominalis* Wied., but will be distinguished by the lateral margins of the thoracic dorsum, and the scutellum, not being so distinctly yellow; it also lacks the large triangular yellow spot in front of the scutellum.

Volucella avida. (Plate VI, fig. 12.)

Volucella avida Osten Sacken, West. Dipt., 333.

Habitat.—California!

♂, ♀. Length, 10 to 12^{mm}. Antennæ light brown; arista loosely plumose above; third antennal joint about one-half or two-thirds of the length of the arista, its basal half a little expanded; face pale whitish-yellow, a narrow black stripe runs from the mouth upward, becoming paler and finally obsolete before reaching the antennæ; cheeks black, shining; frontal triangle of the male whitish-yellow, beset with black pile; profile straight, in the male with a slight depression under the antennæ, more receding on the lower part in the female. Thorax greenish-black; on each side between the humerus and scutellum a rather broad, dull, yellow stripe; in front of the scutellum a yellowish, rather obscure parallelogram, marginate anteriorly; sides of the dorsum and pleuræ beset with yellowish-white hairs. Scutellum yellowish, subtranslucent, beset with black hairs along the edge. Abdomen pale honey-yellow; first segment black, the second and third segments posteriorly with a narrow black margin, expanded on each side along the lateral margin, and prolonged in the middle in the shape of a longitudinal black stripe toward the anterior margin; on the second segment this stripe is broadly expanded so as to coalesce with the black of the first segment; on the third segment, on the contrary, it is tapering anteriorly; fourth segment with a black crossband a little beyond the middle, with a subtriangular expansion in the middle reaching toward the fifth segment; fifth segment black on the sides, in the male the hypopygium black; the abdomen is clothed with short black pile on its black portions and with yellowish pile on the yellow regions, especially on the sides of the second segment and on the posterior part. Femora black; knees and basal half of the tibiæ brownish-yellow, tarsi black. Wings hyaline; latter half of the costal cell and the interval between the auxiliary and first longitudinal vein as far as the stigma brownish; stigma dark brown, central cross-veins and small cross-veins with well defined brown clouds; the second vein ends in the first some little distance before the tip of the latter.

Five specimens.

Volucella isabellina, n. sp.

Habitat.—Arizona!

♀. Length, 15 to 16^{mm}. Face pale whitish-yellow, with a narrow brown stripe on the lower two-thirds, paler and obsolete above; pile in the middle black, on the sides mixed with white; cheeks with a rather narrow brownish-black stripe running from the eye to the tip; behind with a fringe of white pile. Front of the same color as the face with side grooves and clothed with black pile. Front gently and evenly convex; face lightly concave below the antennæ, receding on its inferior half. Antennæ brownish, or reddish; rather short, the third joint somewhat longer than in *avida*, expanded on its basal portion. Thorax greenish-black; on each side between the humerus and scutellum a rather broad dull honey-yellow stripe; in front of the scutellum a yellowish, rather obscure, parallelogram; the black is thickly dusted, leaving slender stripes and the narrow borders shining blackish; sides of the dorsum and the pleuræ beset with the yellowish-white pile, on the post-alar callosities mingled with black hair. Scutellum yellowish, subtranslucent, beset with black pile on its disk and edge. Abdomen light yellow; first segment black, second segment posteriorly with a rather narrow black margin, obsolete in the middle, expanded somewhat toward the sides, in front with a narrow black triangle reaching to about the middle of the segment; third segment with the anterior margin light yellow, more or less red on the middle part, a deep black on the posterior portion, which on the sides reaches to near the middle of the segment; this black border is a little wider than that on the preceding segment and like that interrupted, or obsolete in the middle; fourth segment with a black spot on each side on it posterior margin; on the anterior angles of each segment there is light yellow pile, elsewhere with short black hairs. Femora black at the base, on the other part, and the basal portions of the tibiæ and tarsi, brownish-yellow; terminal part of tibiæ and the last three joints of all the tarsi, darker, the latter black at the tip. Wings pure hyaline; stigma yellowish-brown; the anterior cross-vein, furcation of second and third longitudinal veins, and veins at base of discal and last posterior cells narrowly clouded with deep brown.

This species resembles *V. avida*, but differs in the greater size, in the cheeks not being wholly black, in the black of the abdomen being obsolete in the middle, and in the third antennal joint being longer; the front of the female, also, is narrower above. The profile of the face in the male is probably straighter and less receding in its lower part than in the female.

Volucella vesiculosa. (Plate VI, fig. 1, 1*a*.)

Syrphus vesiculosus Fabricius, System Antl., 226, 11.

Volucella vesiculosa Wiedemann, Auss. Zw. Ins., ii, 201, 11; Macquart, Dipt. Exot. 3e Suppl., 39; tab. iv, fig. 3.

Habitat.—Pennsylvania, Connecticut, Maryland, Kentucky, Florida!, South America.

♂, ♀. Length, 9 to 10mm. Head reddish-yellow; eyes of male contiguous for a long distance, the frontal triangle very small. Antennæ reddish-yellow, third joint long, a little broader at its base, but not excised on either border; arista about twice the length of joint, long plumose above, short below. Face considerably excavated below the antennæ, with a rounded protuberance, distinctly concave immediately below; pile of face short, rather sparse, white. Dorsum of thorax brilliant purple-colored, with a cobalt blue reflection, the front border, humeri, and sometimes the sides, yellow. Scutellum more yellowish, except on the dorsum, where it is more or less brilliant, like the thoracic dorsum. The pile of the thorax is sparse, black; along the lateral sutures, the post-alar callosities, and border of the scutellum with rather long, very distinct black bristles. Abdomen a beautiful brilliant purple, or coppery red, with the cobalt reflection; the first segment, and the anterior part of the second (more broadly in the middle) yellowish-white, subtranslucent; pile very short, rather abundant, whitish. Legs luteous, except the basal two-thirds or more of all the femora, and the terminal portion of the tibiæ and tip of tarsi, which are black or brown. Wings hyaline, a faint spot at tip of the auxiliary vein; anterior cross-vein rectangular, close to base of discal cell.

Five specimens.

Volucella sexpunctata. (Plate VI, fig. 2.)

Volucella sexpunctata Loew, Wien. Ent. Monatschr., v, 38; id., Centur., vi, 37.

Habitat.—Florida!, Cuba (Lw.).

♂, ♀. Length, 8 to 9mm. Allied to *V. vesiculosa*. Yellow and luteous, moderately shining. Front, except the vertex, black pilose, face considerably produced, shining, below the antennæ lightly pollinose, protuberance large, obtuse; pile short, whitish. Pectus black, or with four black spots. Dorsum of thorax more reddish or brownish above, clothed with short white pile; on the sides and border of scutellum with rather long yellowish white bristles; the scutellum itself more yellowish translucent. Abdomen nearly bare; yellow translucent, or even subtransparent at the base, towards the tip often brownish, perhaps more or less the result of drying; the posterior margins of second, third, and fourth segments each with a rather small, quadrangular black spot, on either side near the lateral margin; on the second and third segments they are broader than long, and often joined by a posterior brown fascia; the second and third segments sometimes in the middle behind with a distinct black spot; pile very short, near the posterior margins of the segments black, elsewhere pallid. Legs yellow, tip of anterior tibiæ and tip of all the tarsi blackish. Wings quite hyaline; a small brownish spot near the tip of auxiliary vein; the third vein reaches the costa near tip of wing, the second vein joins the first very near its end, sometimes beyond it, so that the marginal cell is open.

Four specimens, compared with the types at Cambridge.

Volucella satur. (Plate VI, figs. 11, 12 *b*.)

Volucella satur Osten Sacken, West. Dipt., 333.

Habitat.—Kansas, Colorado! Utah (O. S.).

♂, ♀. Length, 9 to 10^{mm}. Antennæ light brown, arista reddish, loosely plumose, third joint nearly as long as the arista, very narrow in the male, a little broader and more expanded in the female. Face yellow, a black stripe runs obliquely from the lower corner of the eye to the anterior oral margin; behind it the cheeks are narrow; profile of the face nearly straight in the male, in the female a little receding on the lower part, the depression below the antennæ is very slight. Frontal triangle of the male yellow, beset with black pile, the vertex black; in the female the front is broad, of a greenish tinge, as if underlying the yellow; a slender median yellow line runs from the antennæ towards the yellow vertex; the ocelli are on a cordiform black spot. Eyes pilose. Thorax blackish-green; on each side between humerus and scutellum a rather broad, dull, honey-yellow stripe, with a short black streak in the middle; in front of the scutellum a yellowish, rather obscure parallelogram, emarginate anteriorly; pleuræ with a large yellow spot, beset with yellow pile. Scutellum yellow, with black hairs on the edge. Abdomen honey-yellowish; first segment black, second and third with a narrow black hind border; the black border of the second segment is connected with the black of the first segment by a black longitudinal stripe, which is narrow in the female, broad and triangularly expanded anteriorly in the male; fourth segment with a broad black hind border; fifth segment black. Femora black; knees and two-thirds of the tibiæ brownish-yellow, the last third black, or, on the intermediate pair, brownish; tarsi reddish at base, brownish or black at tip. Wings grayish-hyaline; stigma yellowish, with a small pale-brown cloud; cross-veins at the base of first and last posterior cells, and of the discal cell, and the origin of the third vein, with small indistinct browish clouds; there are still smaller, almost imperceptible clouds at the tip of the second vein, near the junction with the first, and on the curvature of the vein closing the first posterior cell; the latter section of vein is more rounded here than in *pusilla* and *fasciata;* the marginal cell is not quite so much expanded at its end; anterior cross a little before the middle of the discal cell.

Three specimens, Western Kansas and Colorado.

Volucella tau. (Plate VI, fig. 13.)

Volucella tau Bigot, Annales Soc. Ent. de France, 1883, 84.

Habitat.—California!, Mexico (Bigot).

♂, ♀. Length, 9 to 10^{mm}. Two male and one female specimens from California, which agree with Mr. Bigot's description of a male from Mexico, are very closely allied to *V. satur*, yet are apparently different. In all three specimens the spots on the wings are very distinct dark brown, though small; the antennæ are distinctly longer and more slender (see figure). Mr. Coquillett, to whom I am indebted for the privilege of examining the specimens, has also compared a number more with drawings of the antennæ of both species which I sent him, and finds the difference constant. The female has the markings of the abdomen nearly as in *satur*, that is with the black cross-bands entire; but the male is very distinctly different. In this sex the black markings are confined to the first segment, and an inverted ⊤-shaped spot on the second segment, the posterior black band being abbreviated a considerable distance before the lateral margin. The third and fourth segments have only an indistinct, somewhat brownish, color behind. The hypopygium is black.

Volucella obesa. (Plate V, fig. 9.)

Syrphus obesus Fabricius., Syst. Ent., 763, 5; Ent. Syst., iv, 282; Syst. Antl., 227.

Volucella obesa Wiedemann, Auss. Zw. Ins., ii, 199; Macquart, Hist. Nat. Dipt., i, 494, 5.

Ornidia obesa St. Fargeau and Serville, Encycl. Meth., x, 786.

? *Volucella azurea* Phillipi, Verh. Zool. Bot. Gesell., 1865, 734, pl. xxvi, fig. 35.

Habitat.—Tropical regions (auct.), San Domingo, Mexico, New Mexico!, Florida, (O. S.).

♂. Length, 9.5^{mm}. Brilliant shining green with violet reflections. Antennæ brown, third joint very short, subtriangular; arista yellow, black at tip, thickly plumose. Frontal triangle small, only a little swollen, pile black. Face a beautiful green with violet reflections in certain lights, thinly pilose; immediately below the antennæ there is a large white pollinose spot, and opposite it, near the eyes, a small one. In profile the face is obtusely conical below, not descending far under the eyes; below the antennæ rather deeply concave, near the middle of the face with a large hemielliptical tubercle, and above it, on each side, a somewhat smaller one, so that two distinct parallel grooves are seen corresponding to the antennæ. Eyes thickly pilose, contiguous for a long distance; vertical triangle small, black. Thorax with short, black pile, in color brilliant green, above in front with distinct bronze or violet reflections. Second segment of the abdomen on each side with a large, less shining, and more purplish, but not conspicuous spot; pile of abdomen short, black, on the fourth and fifth segments longer, yellow. Venter, pectus, and cheeks very brilliant bright green. Legs black, the femora slightly shining green; tarsi more brownish or reddish black, the hind metatarsi thickened, and as long as the remaining joints together. Wings nearly hyaline, faintly brownish toward the base; a small but very distinct brown spot reaches from the costa to the fourth vein over the cross-vein, which is very near to the base of the discal cell; at the junction of the first and second veins there is a minute brown spot; the marginal cell at the tip juts strongly into the submarginal cell.

Five specimens from San Domingo and one from New Mexico (E. Keen). The synonymy of *V. azurea* Phillipi seems probable; the figure does not, however, show the bend near the tip of the second vein.

Volucella pusilla. (Plate VI, figs. 3,3*a*.)

Volucella pusilla Macquart, Dipt. Exot., ii, 2, 21, 1, tab. v, fig. 1.

Habitat.—Florida!, Cuba.

♂ ♀. Length, 9 to 10mm. Face produced directly downwards, only slightly excavated below the antennæ, with a slight convexity on the lower half; yellow, with white pile; a rather broad black stripe extends from the base of the antennæ to the tip, on the oral margin confluent with the black of the cheeks, the latter with a narrow yellow stripe. Front in female yellow, with broad black stripe from the ocelli to the antennæ; the pile is fuscous, black at the vertex. Antennæ brownish-black, the second joint yellow at its base, third joint, in the male, long, rather slender, very little broader at the base; in the female much broader throughout, with the basal portion distinctly convex above; arista a little longer than the joint, loosely plumose. Eyes in both sexes thickly black pilose. Dorsum of thorax black shining in its middle, with blackish and yellowish pile; on the sides, extending from the humeri to the posterior angles, with a broad yellow stripe containing an oval black spot in its middle; in front of the scutellum there are two small, rounded, yellow spots; pleuræ with two yellow spots, the larger with a bush of whitish pile on the upper half, the other, smaller, spot is above the front coxæ. Scutellum light yellow, translucent, towards the base with yellow pile, along the border with conspicuous black pile. Abdomen black, a little shining, on the anterior part of the second segment with a narrowly interrupted yellow band, broadest on the sides; third segment on each side with a large quadrangular yellow spot, not reaching the margin and inclosing an oval black spot, sometimes confluent with the black of the margin. On the anterior segments the pile is black on the black portions; elsewhere yellow; beyond the third segment, longer, whitish. Legs black, with black pile, the first and second joints of all the tarsi yellow, the knees more or less reddish. Wings with brown markings as follows: across from the origin of the third vein to the origin of the posterior basal cross-vein, from the tip of the auxiliary to the fourth, clouding the anterior cross-vein, and from the costa beyond the auxiliary vein to the outer posterior angle of the discal cell, sharply defined on its inner border and reaching to the tip of the third vein, the posterior portion infuscate, the costal cell somewhat brownish; anterior cross-vein oblique, a little before the middle of discal cell; end of marginal cell expanded.

Four specimens (Professor Riley).

Volucella fasciata. (Plate VI, fig. 4.)

Volucella fasciata Macquart, Dipt. Exot., ii, 2, 22, 2; pl. v, fig. 2; Osten Sacken, West. Dipt., 334.

Habitat.—Western Kansas, Colorado, Texas, Mexico, Carolina!

♂. ♀. Length, 7 to 8^{mm}. Resembles *pusilla* closely, but is distinct. The yellow stripe of the cheeks is broader, the antennæ yellow, brownish toward the tip, the yellow lateral stripes of the dorsum of the thorax narrower, the meso-pleural spot smaller, and in addition there are three small spots below, nearly touching each other, the hindmost one in front of the halteres. The abdomen has three rather broad yellow bands; the anterior one on the second segment the broadest, widest toward the middle, interrupted or subinterrupted; the others, on the anterior part of the third and fourth segments, entire; venter, in addition to the broad basal band, with one on the third segment. Legs black; the knees, basal portions of the tibiæ, and first three joints of all the tarsi, yellow. Wings with the markings similar in pattern to *pusilla*, but faint, showing indications of three or four fasciæ; the small cross-vein more oblique, and joining the fourth vein very near the middle of the discal cell.

It is not improbable that this is the *V. vacua* of Walker, List, etc., iii, 637.

Volucella victoria, n. sp.

Habitat.—New Mexico!

♀. Length, 9.5^{mm}. Deep shining blue-black. Front and face amber yellow, the cheeks shining black; lateral crescentric grooves of the front very distinct; a minute spot at the ocelli black; pile black; face below the antennæ very shallowly concave, produced downwards into an acute cone, thinly black pilose. Antennæ wholly yellowish-red; third joint of moderate length, a little broader at the base, scarcely emarginate above; arista black, moderately plumose. Occiput black, except for a little distance below the vertex, on the sides dusted with whitish. Thorax thinly pilose, in front chiefly light colored, behind chiefly black. Scutellum deep pitchy-black; on its border, and also on the post-alar callosities, with fine black bristles. Abdomen with a blue reflection, clothed with very short black pile, a little longer toward the tip. Legs wholly black, the tarsi on the inner side with short reddish pile. Wings nearly hyaline; a black spot at the tip of the auxiliary vein, beyond which the stigma is yellowish; the small cross-vein, the cross-veins at base of discal and third posterior cells, the last section of the fourth vein, and the second vein near its tip with narrow black clouds; second vein near its tip gently bent into the submarginal cell, last section of the fourth vein strongly bent inwards.

Three specimens, New Mexico (G. F. Gaumer), for which I am indebted to Mr. Eugene L. Keen, of Philadelphia.

Volucella (Temnocera) megacephala.

Temnocera megacephala Loew, Centur., iv, 57; Osten Sacken, Cat. Dipt., 130.

Habitat.—California (Lw.), Arizona, Mexico!

♀. Length, 13mm. Short, broad, luteous. Head very large, sordid luteous; front and face with short black pile; pile of the eyes very short, whitish. Occiput and cheeks dilutely luteous; face moderately produced, the usual tubercle nearly wanting. Antennæ ochraceous, very short, the third joint moderately excised above. Dorsum of thorax with two rather obsolete, broadly separated, blackish stripes. Scutellum wholly luteous. Pile of the dorsum and the scutellum, except its border, short, black, the border of the latter with pallid, less abundant pile, and without bristles. Pleuræ above luteous, below black. Abdomen broad, subfuscous, the base of each segment narrowly luteous and clothed with pallid pile. Venter dilutely luteous, pile very short, pallid, a black median interrupted stripe black pilose. Coxæ and trochanters black; legs ochraceous luteous, pallidly pilose, tip of the tarsi obscurely fuscous. Wings hyaline, apical half of the costa broadly margined with cinereous black; the transverse veins clouded with a more saturate black color.

Translation from the original, compared with the type specimen in the Museum of Comparative Zoology at Cambridge.

Three specimens, male and female, apparently of this species, from Arizona and Mexico (J. Aquilera), I have since examined. The pilosity of the eyes is woolly, the pile of the face only in part black. The male eyes are contiguous for a very long distance, the frontal triangle small. The third joint of the antennæ is but very slightly excised above, and the absence of bristles on the scutellum makes it seem strange that Loew should have located the species under Temnocera. In the male specimen there is, in addition to the two remote dorsal thoracic black stripes, which might better be called spots, a median one. In only one specimen does Loew's description of the abdomen apply; in the others the second segment is luteous, except the outer posterior parts. The third segment is broadly yellow in front, black behind; the fourth segment broadly yellowish and luteous, except two large, indefinite black spots behind. The species is a large one, more especially characterized by its large head. In all my specimens the length is somewhat greater than that given above. The apical half of the costa is not at all margined with cinereous black, though the veins in that region are narrowly blackish clouded. Of course it is possible that my determination is not correct, the more so from the fact that the species belongs to a group the members of which are not easily distinguishable.

A single specimen from Mexico with the preceding (J. Aquilera), and resembling it, I have not been able to determine. The head, in structure and coloration throughout, is very nearly the same, except that perhaps the third joint is a little more excised above, and there is a broad brown stripe on the cheeks. The dorsum of the thorax, except broadly on the sides and behind, is shining black. The second, third, and fourth segments of the abdomen have a broad, indefinite, posterior blackish band. The legs are darker colored, towards the base of the femora, blackish. The wings on the outer half are almost pure hyaline; the base of the wings is brownish, lighter in the basal cells, and becoming dark brown on the outer part of the costal cell; opposite this darker color the cross-veins are all clouded broadly with dark brown, forming a large, conspicuous, coalescent dark-brown spot. The abdomen is less robust, and the size smaller (12^{mm}).

Volucella (Temnocera) Hagii. (Plate V, fig. 8.)

Volucella Hagii Jaennicke, Neue Exot., Dipt., 89.

Temnocera setigera Osten Sacken, West. Dipt., 334; v. d. Wulp, Tijdschr. voor Ent., xxv.

Habitat.—Mexico (Jaen.), New Mexico (O. S.), Arizona!

♂, ♀. Length, 14^{mm}. "Proboscis nearly twice as long as the head, pointed at the end. Face and front honey-yellowish, clothed with black pile, which is very short on the face and longer on the front; the face is excavated below the antennæ, its lower part projecting in the form of a cone, the tip of which is bifid and slightly infuscated. Antennæ: first two joints yellowish-brown; third joint light brown, excised above, so that its latter portion is much narrower; arista, feathery, black; proboscis 7 to 8^{mm} long [a little shorter in the male], black, pointed. Thorax densely clothed with a yellowish recumbent pubescence, and, mixed with it, short, black, erect pile; they almost conceal the dark greenish ground-color, as well as the obscurely visible yellowish lateral stripes and large yellowish spot in front of the scutellum; on the sides of the thorax, several stiff black bristles; a pair [or more] of such bristles, but smaller, a little in front of the scutellum; pectus blackish. Scutellum somewhat inflated, honey-yellow, beset with mixed black and yellow pubescence; along the edge fourteen stiff black bristles. Abdomen brownish-yellow [or yellow]; second and third segments with broad blackish parallel borders posteriorly, formed of short and very dense black hairs; the cross-bands thus produced are very distinct when viewed obliquely, although almost invisible when viewed from above;

that on the second segment occupies more than one-third [or one-fourth], that on the third more than one half [or one-third], of the length of the segment; segment four shows posteriorly a semicircular, black, shining spot, occupying the whole posterior margin and reaching beyond the middle of the segment anteriorly; segment five [in the female and the hypopygium in the male] black. Femora black, knees and anterior half [or third] of the tibiæ brownish yellow; the remainder of the tibiæ, as well as the tarsi, are darker [the first three joints of the tarsi in the male are red]. Wings grayish hyaline; cross-veins and tip of second vein with small brown clouds; stigma brown.

"One specimen, Vermejo River, New Mexico, June 25."

A single male specimen from Arizona (Mr. E. Keen) shows only unimportant differences from the foregoing description of the female by Osten Sacken. These differences are included in the brackets.

Volucella (Temnocera) pubescens.

Temnocera pubescens Loew, Wien. Ent. Monatschr., v, 38; Centur., vi, 35.

Habitat.—Cuba (Lw.).

♀. Length, 12.5^{mm}. Black; the head, dorsum of thorax, upper part of the pleuræ, and base of the abdomen, lutescent, antennæ subfuscous, wings cinereous-hyaline, the transverse veins wholly, the auxiliary and the third longitudinal veins at their tips clouded with fuscous.

Head luteous, posterior orbits of the eyes white pollinose. Lower part of the face strongly produced, acuminate, thickly clothed with very short black pile. Antennæ subfuscous, upper margin of the third joint excised, arista black and black plumose. Proboscis elongate, black. Front on each side with an arcuate impressed line, black pilose, intermixed with sparse yellow pile. Thorax luteous; disk of the dorsum with three very broad, confluent, black stripes, very thickly covered with lutescent pile, on the lateral margins and behind sparsely provided with black bristles. Upper part of the pleuræ luteous and luteous pubescent, below with the pectus black and black pubescent. Scutellum inflated, not impressed before the tip, luteous on the disk with black pile, on the margin with luteous, along the border with ten black bristles. Abdomen black, thickly black pubescent first and the greater part of the second segment luteous and luteous pubescent. Wings cinereous-hyaline, base dilutely lutescent, second longitudinal vein at the tip strongly recurved, and, with the tip of the auxiliary, and the transverse viens wholly, slenderly clouded with fuscous.—Translation.

The type specimens of this species are not contained in the Museum of Comparative Zoology.

Volucella (Temnocera) purpurascens.

Temnocera purpurascens Loew, Centur., viii, 52.

Habitat.—Hayti (Lw.)!

♀. Length, 13 to 16^{mm}. Black, scutellum and the first two segments of the abdomen purplish, the remaining segments and the venter deep steel-blue; head and dorsum of the thorax with pallid pile, on the rest of the body black; wings hyaline, with a large black median spot.

Head black, front and face, except the cheeks, yellow, occipital orbits whitish pollinose; pile of the front, of the face, of the eyes, and of the posterior orbits pallid; cheeks bare. Antennæ subfuscous, the first joint and the arista pitchy black. Thorax black shining; the dorsum with light yellowish pile, on the pleuræ and pectus black. Scutellum plane, purplish, or pitchy purplish, without bristles, clothed with black pile. Abdomen broad, somewhat flattened, shining, short black pilose; terminal segments of a deep steel-blue, or a purplish steel-blue, the anterior segments purplish. Venter deep steel-blue, short black pilose. Legs black, with short black pile; tibiæ, except the tip, red, near the immediate base infuscate. Head of the halteres white. Wings rather long, hyaline, with a large black spot, touching the middle of the costa and including the cross-veins; veins before this spot chiefly ochraceous-ferruginous, in the spot itself and on the outer part of the wing fuscous black, the costa itself and the first three longitudinal veins near the spot ochraceous-ferruginous.

Translation from the original, compared with the two type specimens in the Museum of Comparative Zoology at Cambridge.

Volucella apicalis.

Volucella apicalis Loew, Centur., vi, 36.

Habitat.—Cuba (Loew)!

♂. Length, 6.5^{mm}. Yellowish-reddish, base of the abdomen lighter, the tip more obscure, very obsoletely roughened. Dorsum of thorax with scoriaceous stripes, ultimate joints of the tarsi black, apical half of the wings blackish clouded.

Head luteous, face much produced, shining, the antennæ of the same color, the third joint above lightly concave. Thorax yellowish-reddish, with four dorsal, scoriaceous stripes, pectus piceous. Abdomen yellowish-red, the first two segments (except the hind margin of the second) pallid, terminal segments obsoletely subscoriaceous. Legs saturate luteous; third joint of the front tarsi black fuscous, last two joints of all the tarsi black. Halteres white. Wings dilutely sublutescent, near the costa luteous, posterior margin clouded with cinereous, veins of the apical half broadly and indeterminately clouded with fuscous black, the clouds of the second, third, and fourth veins confluent.

Description translated from the original and compared with the type specimen in the Museum of Comparative Zoology.

Volucella chaetophora, n. sp.

Habitat.—Mexico!

♂. Length, 10^{mm}. Face, yellow translucent, lightly pollinose on the sides above; not much produced downward, the nearly straight lower border of the cheeks forming an angle of about 100°–110° with the plane of the occiput; in the middle of the face, with a prominent tubercle, shallowly concave below the antennæ. Third joint of the antennæ not very elongate, slender, broader at the base, not at all emarginate, yellow; arista densely plumose. Frontal triangle small, black, pilose in the middle. Dorsum of thorax shining cobalt blue, with sparse black pile. Scutellum cobalt blue, but showing a translucent reddish cast; on its border with six strong bristles. Abdomen brownish black, shining. Legs reddish black. Wings hyaline.

♀. Front narrowed above, black, with light pile. Abdomen with a subopaque cross-band on the posterior part of the second and third segments.

Two specimens, Isthmus of Tehuantepec (National Museum, Professor Riley's collection).

Volucella, n. sp.?

Habitat.—Mexico!

♂. Resembles the preceding closely, but the antennæ are darker, there is a black facial stripe, and a similar one on the cheeks, and the face is broadly pollinose on the sides. The second abdominal segment has a broad, luteous stripe on the sides, and the third segment has a narrow, broadly interrupted, cross-band of the same color. The wings are broadly brown on the outer part, especially in front. One specimen, with those of the preceding species.

ADDITIONAL NORTH AMERICAN SPECIES.

Volucella abdominalis Wiedemann, Auss. Zw. Ins., ii. 196, ♀; Macquart, Dipt. Exot., ii, 2, 25, 8.—Cuba.

Volucella amethystina Bigot, Ann. Soc. Ent. de France, 1875, 479.—Mexico.

Volucella aperta Walker, Trans. Ent. Soc., N. Ser., v, 292.—Mexico.

Volucella castanea Bigot, Ann. Soc. Ent. de France, 1875, 476.—Mexico.

Volucella chalybescens Wiedemann, Auss. Zw., ii, 204.—Brazil; Jaennicke, Neue Exot. Dipt., p. 4.—Cuba.

Volucella fulvicornis Bigot, Ann. Soc. Ent. de France, 1883, 1884.—Panama.

Volucella lata Wiedemann, Auss. Zw. Ins., ii, 195.—Mexico.

Volucella mellea Jaennicke, Neue Exot. Dipt., 88.—Mexico.

Volucella nigrifacies Bigot, Ann. Soc. Ent. de France, 1875, 479.—Mexico.

Volucella picta Wiedemann, Auss. Zw. Ins., ii, 201; Bigot, in R. de la Sagra, etc., 802.—Brazil (W.), Cuba (Big.).

Volucella pulchripes Bigot, Ann. Soc. Ent. de France, 1875, 480.—Mexico.

Volucella postica Say, J. Acad. Phil. vi, 166, 2; Compl. Wr., ii, 360.—Mexico.

Volucella purpurifera Bigot, Ann. Soc. Ent. de France, 1875, 477.—Mexico.

Volucella tibialis Macquart, Dipt. Exot. 1er Suppl., 123, 14.—Yucatan.

Volucella tricincta Bigot, Ann. Soc. Ent. France, 1875, 477.—Mexico.

Volucella tristis Bigot, Ann. Soc. Ent. de France, 1875, 482.—Mexico.

Volucella (Temnocera) unilecta Walker, Trans. Ent. Soc. N. Ser. v, 292.—Mexico.

Volucella varians Bigot, Ann. Soc. Ent. de France, 1875, 481.—Mexico.

Volucella variegata Bigot, Ann. Soc. Ent. de France, 1875, 478.—Mexico.

Volucella viridula Bigot, Ann. Soc. Ent. France, 1875, 481.—Mexico.

Volucella (Temnocera) viridula Walker, Trans. Ent. Soc. N. Ser. v, 292.—Mexico.

Volucella violacea Say, J. Acad. Phil., vi, 166, 1; Compl. Wr., ii, 360.—Mexico.

COPESTYLUM.*

Copestylum Macquart, Dipt. Exot. 1e Suppl., 124, 1846.

Wholly like some species of *Volucella* (e. g., *V. fasciata*, *V. satur*, etc.), except in the structure of the antennæ. Body short; abdomen short, broad, oval, fasciate; legs rather slender. Face produced directly downwards, obtusely conical below, pointed and notched at the tip, slightly tuberculate below the middle; front arched; antennæ situated near upper third of head in profile, slender, first joint very short, second joint a little elongate, third joint slender; arista inserted near the base, longer than the joint, thickened throughout its length, densely plumose with short, flattened, hair-like pile, appearing under a low-power glass like a solid mass, under a higher power (20–30 diameters) the arista shows a gradual thickening to near its end; the pile is fine near its insertion, but flattened beyond, in structure not unlike elongated scales from some lepidoptera. Eyes pilose, contiguous in male. Wings as in Volucella, marginal cell closed and petiolate, tip of fourth vein bent inward, small cross vein near middle of discal cell, oblique. Type of genus *C. marginatum* (Say) O. S., North America.

Copestylum marginatum. (Plate VII, figs. 1, 1*a*, 1*b*.)

Volucella marginata Say, Jour. Acad. Phil., vi, 167, 3; Compl. Wr., ii, 360; Osten Sacken, West. Dipt., 333.

Copestylum flaviventris Macquart, Dipt. Exot. 1e Suppl., 125; pl. x, fig. 16.

Copestylum marginatum Osten Sacken, Cat. Dipt., 130.

Habitat.—Mexico (Say), Venezuela (Macq.), Texas, Arizona, Montana, California!

♂, ♀. Length, 9 to 11^{mm}. Face whitish yellow, with a black median stripe, reaching from, or near, the base of the antennæ to the oral margin; cheeks black, shining, with a narrow yellow stripe running from the eye to the oral margin, sometimes the yellow predominates, leaving only a black stripe; antennæ varying from a light yellowish-red to quite black, second joint about one-third the length of the third joint. Frontal triangle black, shining, or with two oblong yellow spots near the orbit (var. *lentum*, name new), pile usually light-colored, sometimes black; front in female black on the upper half, on the sides below the yellow of the face sometimes extends up, partly cut off by an expansion from the black at the base of the antennæ; near the middle of the front are two small, oval spots, that are sometimes wanting, at other times confluent with the yellow of the sides. Thorax black, shining, with whitish pile, which is longer on the pleuræ; sides of dorsum with a stripe, entire or interrupted, and two spots in front of the scutellum, yellowish. In other specimens the pile is longer, mixed with black, or wholly black, and the yellow of the dorsum is entirely wanting (var. *lentum*). Scutellum yellow, with white, blackish, or black pile. Abdomen black, with three interrupted bands; the first two pairs of spots large; the third narrow, either a light translucent yellow or an inconspicuous bluish; in some specimens the yellow becomes more or less confluent, so that the dorsum is chiefly yellow; venter wholly black, with a light yellow median transverse band, or wholly yellow, except the tip. Legs black; tibiæ on the proximal third yellowish, metatarsi and sometimes the second and third joints red; wings hyaline; stigma brownish.

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* Κοπή, a striking, and στυλος, a style.

Thirty specimens (Comstock, Coquillett, Morrison).

This species shows very great variation in color and markings. In isolated specimens one would scarcely consider the differences to be less than specific, but the variations are inconstant, and do not seem to be of more than varietal worth. Some specimens agree well with Macquart's description and figure, while others have still more yellow, as in Say's specimens. A very dark variety in which the thorax is clothed with black pile and wholly lacking the yellow of the sides and before the scutellum, the venter wholly without yellow and the antennæ black, may be distinguished as variety *lentum*.

In nine specimens from Montana (Professor Comstock) the size is distinctly smaller, the facial stripe is narrower and distinctly separated from the black at the base of the antennæ by a yellow interval, the frontal triangle is yellow along the eyes and the outer part of the second vein is less sinuous. These differences are possibly specific.

Copestylum limbipennis, n. sp.

Habitat.—Mexico!

♀. Length, 9^{mm}. Face black, clothed with short, white pile, with two rather narrow yellow stripes, convergent below. Front black, with short, white pile, and a small yellow spot on each side near the middle. Antennæ brown, second joint red; third joint not twice the length of the second, not one-half as long as the arista; arista long, black, gradually and symmetrically widened from the base to near the tip. Eyes with short, not abundant, white pile; in the middle with an elongate, vertical stripe of black pile. Thorax shining black, with short, white pile; a small spot behind the humeri, a slender intra-alar vittula, and two small spots in front of the scutellum, yellow; the pleuræ with a small, vertical yellow spot on the meso-pleuræ. Scutellum yellowish brown, subtranslucent. Abdomen black; an oval, oblique spot on each side of the second segment, toward the front, a larger semi-oval spot on each side of the third segment in front, and the fourth segment almost wholly yellowish red or reddish yellow; venter black, with a pair of large oval spots on the posterior part of the second segment. Legs deep mahogany-black. Wings hyaline, broadly brown in front, the brown beginning gradually from near the origin of the second vein, and filling out uniformly the costal, subcostal, marginal, and all of the submarginal cells, and clouding the posterior margin of the third vein, the anterior cross-vein, the distal part of the fourth vein, the posterior cross-vein, and the veins at outer end of the second basal cell.

A single specimen, Isthmus of Tehuantepec (National Museum, Professor Riley's collection). This specimen, although I have but the one for comparison, offers most excellent structural differences from *O. marginatum* in the antennæ, in the front being considerably narrower above, and in the slender pilose stripe of the eyes. The pile on the eyes of *marginatum* is black in the middle, but does not present the distinct vittulate appearance; it is also throughout much longer in *marginatum*. The broad, brown marking of the outer anterior part of the wings is conspicuously different. The coloration of the body and legs is probably variable. On either side of the base of the antennæ there is a small, yellow spot, and the cheeks show an indication of a yellow stripe.

SERICOMYIA.*

Sericomya Meigen in Illiger's Magaz., ii, 274, 1803.

Large, robust, thinly pilose species, black, with yellow interrupted fasciæ on the abdomen. Head hemispherical, somewhat flattened. Antennæ short, third joint rounded or subquadrate, arista feathery plumose. Face lightly excavated, or nearly straight below the antennæ, with a slight convexity near the middle, thence concave to the oral border, descending moderately below the eyes, in profile obtuse. Eyes bare, contiguous in the male. Abdomen elongate oval, broader than the thorax, gently arched, nearly twice as long as the thorax. Legs strong, hind femora sometimes somewhat thickened, hind tibiæ somewhat bent, at the tip sometimes with an angular protuberance. Marginal cell open, third vein slightly, sometimes considerably, curved, anterior cross-vein a little before or near the middle of the discal cell, a little oblique. Type of genus, *S. borealis* Fallen, Europe.

TABLE OF SPECIES.

1.—Black facial stripe very broad; bands of abdomen yellowish white (?) . **lappona**
Facial stripe moderately broad; bands of abdomen more yellow 2
2.—Second abdominal segment with two yellow dots, or wholly black; hind femora of male considerably thickened . . . . **militaris**
Second abdominal segment with a median, interrupted fascia 3
3.—Yellow abdominal bands broadly interrupted, the spots more or less elongate hour-glass shaped. . . . . **sexfasciata**
The yellow bands narrowly interrupted, the spots not constricted 4
4.—Fourth segment (in the male at least) without yellow cross-band . . **bifasciata**
Fourth segment with cross-band like those of preceding segments 5
5.—Abdominal spots distinctly oblique . . . . **chrysotoxoides**
Abdominal spots transverse . . . . **chalcopyga**

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* Σηρικός, silken, and μυια, a fly.

Sericomyia lappona.

Musca lappona Linné, Fauna suecica, 1794.

Syrphus lappona Fabricius, Spec. Ins., ii, 422, 4; Entom. Syst., iv, 280; Syst. Antl., 226, 7; Fallen, Syrph., 20, 8.

Sericomyia lappona Meigen, Syst. Beschr., iii, 344, 3; Macquart, Hist. Nat. Dipt., i, 496, 3; Zetterstedt, Ins. Lapp., 590, 2; id. Dipt. Scand., ii, 646, 4, viii, 3110; Walker, Ins. Brit., i, 263, 2; Schiner, Fauna Austr. Dipt., i, 330; v. d. Wulp, Tijdschr. v. Entom., xxv, 126.

? *Volucella lappona* O. Fabricius, Fauna Groenl., 208, 169.

Habitat.—Europe, Canada (v. d. Wulp.), Greenland ? (O. Fabr.).

♂, ♀. Length, 10 to 12mm. Black. Humeri white pollinose; pleuræ with a tuft of yellow pile; the pile elsewhere short, blackish brown or dark reddish yellow; scutellum yellowish red. The very narrow whitish yellow bands of the abdomen on the second, third, and fourth segments, narrowly interrupted, the last usually entire. Face black, on the sides broadly whitish yellow; front black; antennæ blackish brown, the third joint somewhat lighter. Legs dark reddish yellow, front femora at the base, and terminal joints of the tarsi, black. Wings at the base reddish yellow, on the anterior border grayish brownish, between the end of the marginal cell and the first posterior cell, sometimes a brownish spot.—Translation from Schiner, l. c.

This species is given on the authority of F. M. v. d. Wulp., who compared specimens collected in the vicinity of Quebec. He says: "Dat zij in Canada voorkomt, kann nu als zeker worden aangenomen." The synonymy is given from Schiner.

Sericomyia bifasciata, n. sp.

Habitat.—New Hampshire!

♂. Length, 11mm. Face yellow; cheeks and a broad median stripe shining black. Antennæ brownish red, third joint subquadrate; arista thinly plumose. Dorsum of thorax shining black, thinly dark pilose; on the inner side of each humerus with a spot of silvery pollen. Abdomen shining black; pile on the sides in front yellow; second and third segments each with a yellow cross-band, narrowly interrupted, and broadened on each side; fourth segment wholly shining metallic. Femora except the base, and the tip of tarsi, black; legs elsewhere reddish yellow, the tibiæ in the middle more luteous. Wings brownish in front, the base of the second vein and the middle cross-veins narrowly clouded with brown; third vein not at all curved into the first posterior cell.

Two specimens, Mt. Washington (Dr. Dimmock, National Museum, Professor Riley's collection). In one of these specimens the fourth abdominal segment is somewhat tubulate, in the other it is not differentiated and has less of the bronze lustre; in the same specimen the dorsum of the thorax shows a distinct blue reflection.

Sericomyia sexfasciata.

Sericomyia sexfasciata Walker, List, etc., iii, 596.

Habitat.—Hudson Bay Territory (Walk., Lw.)!

♂. Length, 14.5mm. Face light yellow, thickly whitish pollinose; a rather broad median stripe pitchy black; cheeks black. Antennæ obscurely yellow; the basal joints blackish; the third joint nearly square; frontal triangle black, white pollinose; pile of head light yellow. Dorsum of thorax shining metallic black; clothed with erect, rather abundant pile, in front and narrowly behind, and on the base and border of scutellum, yellow; across the disk of the dorsum and scutellum, black; pleuræ with light yellow pile. Abdomen black, nearly opaque, on the sides of the second segment, narrowly along the margins of the abdomen, and hypopygium, with yellow pile, elsewhere chiefly black pilose; second, third, and fourth segments each with a pair of yellow, elongate, moderately broad spots; the spots do not reach the lateral margins, and are rather broadly separated, and are most especially characterized by a constriction in the middle, especially on the front pair, where they are elongate hour-glass-shaped. Legs black; the base and tip of all the tibiæ, and the tarsi, except the tip, yellow; the tibiæ in the middle more of a deep brown. Wings yellowish hyaline, the immediate base and the stigma yellow; third vein with a gentle curvature into the first posterior cell.

One specimen, in the Loew type collection at Cambridge.

Sericomyia militaris. (Plate VII, figs. 3, 3*a*, 3*b*.)

Sericomyia militaris Walker, List., etc., iii, 595.

Habitat.—Hudson Bay Territory, Nova Scotia (Walk.), New York, New Hampshire, Colorado, New Mexico, Canada!, Red River.

♂. Length, 15mm. Face whitish yellow, shining; cheeks and broad median stripe black; pile whitish; face receding below the antennæ, then vertical and straight to the protuberance. Frontal triangle black; with black pile, white pollinose on the sides. Antennæ nearly black, third joint subquadrate, but little longer than wide; arista black. Orbit white dusted and with white pile. Thorax black, shining; the dorsum more bluish, clothed with rather abundant pile, darker between the wings; humeri whitish pollinose; on the upper part of the mesopleuræ, and immediately above the suture, with a tuft of whitish yellow pile, another smaller one on the post-alar callosity. Scutellum reddish black on the disk. Abdomen greenish black, somewhat shining, with black pile, whitish yellow on the lateral and posterior parts. Second segment with two small dots, sometimes wanting; third segment with two very narrow, a little oblique spots, acute at their outer ends; the fourth with two similar, a little broader, spots, yellow; the narrow posterior border of second, more broadly on the third, and the fourth wholly, metallic shining; hind margin of the third segment with a fringe of whitish yellow pile. Femora black, their tip, the tibiæ, and first two or three joints of the tarsi, reddish yellow; terminal joints of all the tarsi black. Hind femora thickened, their coxæ with an obtuse tubercle. Wings faintly brownish, anterior basal portion luteous, outer part brownish; third vein somewhat arcuate, cross-vein near the middle of discal cell.

♀. Third joint of the antennæ a little larger; front black, with black pile, and a grayish dusted cross-band below the middle, slender in its middle part. The abdomen is wholly light yellowish pilose; the hind coxæ without a tubercle below, and the femora not thickened nor curved.

Six specimens, White Mountains, New Hampshire, July 15 (Dr. G. Dimmock), Canada (J. B. Caulfield, William Brodie), New York (Vanderzee), New Mexico (Gaumer).

This species in its thickened femora, partially obsolete abdominal cross-bands, and distinctly curved third longitudinal vein, connects this genus with *Arctophila.*

Sericomyia chalcopyga. (Plate VII, figs. 2, 2*a*.)

Sericomyia chalcopyga Loew, Centur., iii, 20.

Habitat.—Sitka (Lw.), Washington, Oregon!

♂, ♀. Length, 12 to 15^{mm}. Front in female black, whitish pollinose on the sides below, clothed with black pile; frontal triangle black pilose. Antennæ reddish black or black, third joint subquadrate, scarcely longer than wide, a little broader at the end; arista blackish, twice as long as the joint. Face yellow, with whitish pile; broad median stripe and cheeks shining black; scarcely at all excavated below the antennæ. Occiput black; orbits yellowish-white pollinose, and with similar colored pile, more or less black above. Thorax black, bluish shining, with blackish pile, more or less yellowish in front and behind; on the mesopleuræ with a yellow tuft, and just above the suture a smaller one. Scutellum more or less reddish on the disk; pile mostly black. Abdomen black, opaque, with short black pile, and with three narrow yellow fasciæ, nearly transverse, narrowly interrupted; second segment on its sides with yellow pile; third segment very narrowly shining on its posterior border; fourth segment broadly behind; fifth segment wholly, shining metallic green, clothed with longer reddish-yellow pile; the lateral margin of the abdomen with a fringe of similar reddish-yellow pile. All the femora slender; black at the base, or nearly entirely so; their outer half or tip, the tibiæ, and first two or three joints of the tarsi, reddish-yellow; terminal joints of all the tarsi black. Wings a little fuscous; in front as far as the cross-vein brownish yellow, beyond faintly blackish; the veins in the yellowish part are mostly yellowish or reddish; third vein very slightly concave, almost straight, cross-vein distinctly before the middle of discal cell, oblique.

Fifteen specimens.

Sericomyia chysotoxoides. (Plate VII, figs. 4, 4*a*.)

Sericomyia chrysotoxoides Macquart, Dipt. Exot., ii, 2, 19, 1; pl. iii, fig. 3 bis. (male).
Sericomyia limbipennis Macquart, ibid., 2e Suppl. 58, 2 (female).
Sericomyia filia Walker, List, etc., iii, 596.

Habitat.—Atlantic States, Canada.

♂, ♀. Length, 10 to 12^{mm}. Face shining, whitish pollinose on the sides; yellowish-white, with similar colored pile; cheeks and a median stripe (which is broadest in its middle, and scarcely reaches the antennæ), black; in profile considerably concave below the antennæ. Antennæ black; third joint about twice as long as broad, rounded on its outer angles; arista black. Front black, shining, opaque across the middle, on the sides below with yellowish-gray dust; pile black. Occiput black, whitish pollinose on the lateral orbits, and with white pile. Thorax black, shining; dorsum with two faint, median, slender, posteriorly abbreviated, opaque stripes; pile sparse, obscurely yellowish or blackish, on the sides with a tuft of yellow pile. Scutellum shining black; pile in large part yellow. Abdomen black, opaque, with the fasciæ more oblique, a little broader and more distinctly interrupted than in *S. chalcopyga;* second segment narrowly; third segment more broadly, and the fourth for nearly half its width on the posterior part; the fifth wholly, shining greenish-black; pile whitish-yellow on the sides in front, the lateral margins, and the posterior portion. Legs yellow; anterior and middle femora black on the basal half, the posterior pair either not at all or a spot near the middle in front; in the male all the femora except their end black, the last two joints of all the tarsi also black. Wings a little clouded on the inner part; in front yellowish-brown with yellowish veins; on the outer part from the first to the third veins blackish; cross-vein before the middle of the discal cell.

Twelve specimens.

The antennæ in the male have the third joint broader toward the end, whereas in the female it is a little narrowed. There can seem to be no doubt of the synonymy of *S. limbipennis*, described from a female, with *S. chrysotoxoides*, described from a male.

ARCTOPHILA.*

Arctophila Schiner, Wien. Entom. Monatschr., iv, 215, 1860; Fauna Austr., i, 331.

Large, thickly pilose species; black, but through the pile light in appearance. Very similar in structure to *Sericomyia*, but distinguishable by the thick pilosity, by the form of the face, which is straight, conical, descending much below the eyes, not truncate, but pointed at the tip; the abdomen is shorter, broader, and more convex above; the hind femora are thickened, and both the femora and the tibiæ are bent. Wings with a brownish spot; the third longitudinal vein considerably bent. Type of genus *A. bombiformis*, Europe.

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*Ἄρκτος, bear, and φίλος, dear.

Arotophila flagrans. (Plate VII, figs. 5, 5*a*, 5*b*.)

Arctophila flagrans Osten Sacken, Bull. Buff. Soc. Nat. Sci., iii, 69; **West. Dipt.,** 335.

Habitat.—Colorado (O. S.), New Mexico!

♂. Length, 13^{mm}. Face wax yellow. Cheeks black. Antennæ: basal joint brownish; third joint reddish, the plumose arista black. Thoracic dorsum densely clothed with yellowish hair, through which, however, the metallic, brownish, coppery, ground-color is apparent; pleuræ black, in the middle with a stripe formed by yellow pile. Abdomen with long yellow pile at the base and on the sides, with reddish hair in the middle and at the tip; between the hairs the black metallescent ground-color is apparent. Legs black; front tibiæ beset on the inside with short golden yellow hairs; three basal joints of the four posterior tarsi brownish-red. Wings with a slight grayish tinge; a brown spot limited by the fourth longitudinal vein, the costa, the small cross-vein, and the origin of the third vein; the latter vein is more deeply sinuate than in *A. bombiformis.*—Osten Sacken, l. c.

Seven male specimens from New Mexico (G. F. Gaumer, E. Keen) are sufficiently well described by the above. The species is easily recognizable.

ERISTALIS.*

Eristalis Latreille, Hist. Nat. des Crust. et Ins., xiv, 363, 1804.
Eristalinus Rondani, Dipt. Ital. Prodr., ii, 40, 1857.
Eristalomyia Rondani, ibid.

Moderate sized to large species, often more or less thickly pilose, frequently nearly bare, of a prevailing black or brownish-black color, usually with more or less yellow on the abdomen. Head hemispherical, but little broader than the thorax. Antennæ short, situated upon a slight convexity of the front, first two joints short, third joint oval; arista basal, bare, pubescent or loosely plumose. Face more or less pilose and pollinose, but slightly excavated in profile below the antennæ, straight, obtuse below, not produced, near the middle with a small prominence. Cheeks broad. Eyes more or less pilose, rarely nearly wholly bare, contiguous in the male, or at least only separated by a sutural space (in some exotic species separated by a distinct interval). Thorax large. Scutellum usually more or less translucent. Abdomen convex, elliptical, longer and broader than the thorax. Legs strong, the hind femora sometimes considerably thickened or dilated, the hind tibiæ more or less, sometimes considerably arcuated. Marginal cell of wing closed; third

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**Eristalis*, a precious stone.

longitudinal vein strongly bent into the first posterior cell; anterior cross-vein near the middle of discal cell, oblique.

1.—Scutellum of the same color as the thorax, abdomen without light markings, wholly shining; eyes bare (except on uppermost part) with small round dark spots; dorsum of thorax in female distinctly vittate; arista bare, **aeneus**

Scutellum more or less yellowish or reddish; eyes distinctly pilose, not so spotted 2

2.—Third segment of abdomen wholly shining, without opaque spots or bands . 3

Third abdominal segment with opaque markings 6

3.—Third joint of antennæ large, red; arista bare. Thinly pilose species; second segment of abdomen with reddish side spots and a shining cross-band; wings on the basal two-thirds in front brown . . . . . **compactus**

Third joint of antennæ of usual size; wings with or without brown . . . 4

4.—Pile of eyes not confined to a vertical stripe; the black of second abdominal segment, at least, in part opaque 17

Pile of eyes mostly confined to a vertical stripe; abdomen wholly shining; large species 5

5.—Honey-bee like in appearance; moderately pilose; base of tibiæ yellowish, posterior tarsi blackish; arista nearly bare . . . . **tenax**

Humble-bee like in appearance; thorax and abdomen with thick long pile (on the dorsum of thorax sometimes blackish pilose, var. *melanostomus*); arista plumose, hind tarsi red . . . . **flavipes**

6.—Thorax with one or more distinct light dusted bands; front in female narrow above 7

Thorax without such transverse bands 11

7.—Hind femora slender; frontal triangle, and front below (♀), with black pile . 8

Hind femora dilated or thickened 9

8.—Arista bare; yellow spots of second segment touching the front border in their whole extent . . . . **atrimanus**

Arista briefly pilose; the opaque black extends nearly the whole width of the front border . . . . **transversus**

9.—Third segment of abdomen with a shining cross-band; dorsum of thorax, besides the front border, with two complete light cross-bands; arista bare . 10

The black of the third abdominal segment wholly opaque; dorsum of thorax with one complete cross-band along the suture; frontal triangle thickly white pilose . . . . **albiceps ♂**

10.—Second abdominal segment broadly opaque black in the middle; lower part of front not wholly white pilose . . . . **albiceps ♀**

Second abdominal segment narrowly black in the middle; pile of lower part of the front, or the frontal triangle, wholly white . . . . . **vinetorum**

11.—Thickly pilose species 19

Moderately pilose species 12

12.—Third abdominal segment with a posterior velvety black cross-band not interrupted in the middle 13

Third abdominal segment with an interrupted band, or none 16

13.—Third segment of abdomen broadly and conspicuously yellow on the sides, joining the yellow of the second segment, the black of the second segment wholly opaque, not extending outwards on the sides behind; the third segment with an opaque spot in front, and an abbreviated cross-band behind; fourth segment metallic; eyes briefly contiguous in male . . . . **Brousi**

Third segment not conspicuously yellow, the posterior opaque fascia of second segment behind reaching toward the lateral margin; eyes broadly contiguous in male 14

14.—Front of female narrow. Deep bluish black; scutellum but very little lighter; second segment of abdomen with inconspicuous side spots; third and fourth segments with a narrow anterior velvety fascia . . . . **saxorum**

Front of female broad; dorsum of thorax not shining steel-blue 15

15.—Lighter markings of abdomen usually quite distinct; third and fourth segments with a small, elongate, opaque black spot in front . . . . **hirtus**

Light markings obsolete, third and fourth segments without opaque anterior spot . . . . **obscurus**, **inornatus**

16.—Third segment of abdomen with an anterior spot and a posterior, opaque cross-band; the opaque of second segment with a small triangular shining spot behind; fourth segment with an oval spot in front . . . . **dimidiatus**

Third segment with one or two small opaque spots only, without posterior cross-band; or wholly shining 17

17.—Wings conspicuously dark colored on the outer part in front; hind femora thickened . . . . **hortorum**

Wings hyaline, femora not thickened 18

18.—Second segment of abdomen with yellow lateral triangles and a posterior, interrupted or subinterrupted velvety cross-band; posterior margin of segments 2–4 yellowish white with a fringe of pale golden pile . . . . **latifrons**

Second segment, except the obsolete or metallic side spots, which extend the whole length of the segment, velvety black; third usually with a velvety triangle in front, the fourth with a similar, but very small one; the yellowish white hind borders fringed less conspicuously with light colored pile . . . . **Brousi**

19.—Second, third, and fourth segments of abdomen broadly reddish yellow on the sides, leaving a narrow black stripe, which is wholly opaque on the second segment, and in front, at least, on the third segment; eyes narrowly separated (♂) . . . . **montanus**

Second, third, and fourth segments not broadly yellow on the sides . . . 20

20.—Third segment with two opaque circular spots near the middle of the segment, **pilosus**

Third segment with a posterior opaque cross-band 21

21.—Posterior opaque cross-band of third segment narrow; fourth segment usually with a small opaque spot in front . . . . **occidentalis**

Posterior cross-band broad; fourth segment wholly shining; more thickly pilose species . . . . **Bastardi**

For other species, see descriptions.

Eristalis tenax. (Plate VII, figs. 7, *7a*, *7b*, *7c*.)

Musca tenax Linné, Fauna Suecica, 1799 (1761).
Musca porcina Degeer, Ins., vi, 45, 1.
Conops vulgaris Scopoli, Entom. Carn., 354, 960.
Conops fuscus Scopoli, l. c., 355, 961.
Elophilus tenax Latreille, Gen. Crust., iv, 324.
Syrphus tenax Fabricius, Spec. Insect., ii, 425; id. Entom. Syst., iv, 288, 36; Fallen, Syrph., 26, 17; Zetterstedt, Dipt. Scand., ii, 661, 7; id. ibid., viii, 3113, 7.
Eristalis tenax Fabricius, Syst. Antl., 238, 24; Meigen, Syst. Beschr. iii, 385, 4; Macquart, Hist. Nat. Dipt., 1, 504, 21; Schiner, Fauna Austr., i, 334; Burgess, Psyche.

Habitat.—Europe, Asia, Africa (Auct.), North America, Japan!

♂, ♀. Length, 12 to 14^{mm}. Eyes with dark pile, more abundant near the middle, in the form of an elongated vertical stripe or ellipse, the middle of which is less pilose. Face and front mostly concealed beneath dense yellowish pollen and similar-colored pile; a broad median facial stripe and the cheeks shining black; the upper part of the front in the female and a spot above the antennæ in both sexes black, with black pile. Antennæ brownish black; arista reddish, darker at the base, nearly bare. Thorax black, but little shining; dorsum covered with yellowish pollen and moderately abundant yellow pile. Abdomen brownish black, nearly bare, wholly shining; the second segment, and sometimes the third, with narrow posterior reddish margins; the usual triangle slender, inconspicuous, obscurely reddish yellow; third segment sometimes with a similar, small, less distinct spot on the sides. Legs brownish black, or black, with yellow pile; tip of femora and basal third of anterior and middle tibiæ light yellow, the distal portion of these tibiæ and all of the hind tibiæ blackish or brownish; middle metatarsi yellow. Wings hyaline, a small spot at tip of auxiliary vein; the disk sometimes broadly but faintly clouded.

Numerous specimens.

The most remarkable thing in connection with this insect is the date of its first discovery in America. Prior to 1874 or 1875 the species had never been recognized by dipterologists, although such an able collector as Baron Osten Sacken had spent many years in the study of our dipterous fauna. At present it is very abundant in New England, and I have seen specimens from the Central and Pacific States. In Professor Riley's collection, however, there is a specimen bearing the date of 1870, and presumably captured in the Western States somewhere. Upon calling this gentleman's attention to the specimen he assured me that the species had long been familiar to him about privies and out-houses, where they are known to breed. It seems probable to me that the species has been in this country for many years, but had never been recognized.

Eristalis æneus.

Syrphus æneus Fabricius, Ent. Syst., iv, 302,88; Fallén, Syrph., 28, 22; Panzer, Fauna Germ., 82, 15; Zetterstedt, Dipt. Scand., ii, 668, 14.

Conops æneus Scopoli, Ent. Carn., 356, fig. 967.

Eristalis æneus Fabricius, Syst. Antl., 244, 57; Meigen, Syst., Beschr, iii, 384, 2; Macquart, Hist. Nat. Dipt., i, 506, 16; Schiner, Fauna Austr. Dipt., i, 333.

Eristalis cuprovittatus Wiedemann, Auss. Zw. Ins., ii, 190, 54.

Eristalis sincerus Harris, Ins. Injur. to Veget., 3rd ed., 609; Walker, List, iii, 611.

Habitat.—Europe, North America!, Algiers, Canary Islands, Malta, Syria.

♂, ♀. Length 8 to 10^{mm}. Dark metallic green, wholly shining. Eyes spotted with small round dots, nearly bare, very slightly pilose near the top. Face and front with grayish pile and pollen, a small spot on the tubercle and the cheeks narrowly shining. Antennæ brown; the third joint yellowish, often the first two joints likewise; arista bare. Thorax and abdomen with obscure yellowish pile. Dorsum of the thorax in the female with five grayish-white stripes, the middle one slender, linear. Scutellum of the same dark metallic green. Tibiæ at the base, sometimes for nearly half their length, light yellow; middle, sometimes all the metatarsi, yellowish; the femora, except the tip, black; distal portion of tibiæ blackish brown. Wings hyaline.

Numerous specimens.

Eristalis hirtus.

Eristalis hirtus Loew, Centur., vi, 66; Osten Sacken, West. Dipt., 335; Williston, Proc. Am. Phil. Soc., 1882, 319.

Eristalis temporalis Thomson, Dipt. Eug. Resa, 490, 77.

Habitat.—Washington, Oregon, California, Colorado, Western Kansas!

♂, ♀. Length, 10 to 15^{mm}. Face black, more or less concealed beneath a sometimes dense grayish or reddish pollen, the pile whitish. A narrow stripe in the middle and the cheeks bare, shining. Below the antennal process the face is nearly vertical to the tip of the tubercle. Frontal triangle convex, with obscure yellowish pile. Eyes in the male broadly contiguous; in the female the front is convex and very broad, the sides converging but very slightly on the upper half; thickly yellowish pollinose, less dense in the middle and upper part, so that the shining ground color appears; thickly clothed with yellowish pile. Antennæ black; arista reddish, briefly pilose near the base. Thorax black, shining, rather thickly clothed with the same obscure yellowish pile. Scutellum sub-translucent yellow, black at the base. Abdomen black; the sides of the second segment with a large triangular spot, usually yellowish, sometimes quite yellow, in others only metallic; the segment elsewhere opaque; third segment with an opaque black fascia behind, not interrupted, and a small triangular spot in front; remainder of the third, and the following segments, shining black, except that the fourth segment usually has a very small triangular opaque spot in front; pile short, obscure yellowish, black on the opaque portions; second, third, and fourth segments usually margined behind with light yellow, in some specimens almost wholly wanting. Legs black; tip of femora and base of tibiæ, the middle tibiæ almost wholly, and the first two joints of the middle tarsi, yellow. Wings hyaline; in some specimens with a large faint brownish spot in the middle of the wing. Thirty specimens.

This species varies much in the yellow coloration of the abdomen. According to Osten Sacken, the specimens with obsolete and sub-obsolete yellow spots on the sides of the second segment seem to come from higher altitudes.

Eristalis dimidiatus.

Eristalis dimidiatus Wiedemann, Auss. Zw. Ins., ii, 180, 41.

Eristalis inflexus Walker, List., etc., iii, 617.

Eristalis niger Macquart, Hist. Nat. Dipt., i, 505, 15.

Eristalis L'Herminierii Macquart, Dipt. Exot., ii, 2, 55, 38 (male).

Eristalis chalybeus Macquart, Dipt. Exot., ii, 2, 55, 39 (female).

Eristalis incisuralis Macquart, Dipt. Exot., 4e Suppl., 139, 64 (male).

Habitat.—Atlantic States, Kansas!

♂, ♀. Length, 10 to 13^{mm}. Face densely clothed with whitish pollen and pile, when denuded the ground color somewhat reddish, in the middle with a large oval shining spot on the tubercle, and the cheeks also, shining black; in profile concave below the antennæ, the tubercle large. Antennæ black, the third joint a little brownish or reddish; arista reddish, very briefly pilose near the base. Front in female clothed with yellowish-whitish pollen and pile, leaving a median stripe brown; on the upper part a small vittula in the middle, a larger oval spot near the eyes, and the ocellar spot, black with black pile. Eyes pilose on the upper part; frontal triangle not much longer than the suture between the male's eyes, a little shining in the middle. Thorax with short, not abundant, light colored pile; shining greenish black with two or three indistinct, somewhat opaque stripes. Scutellum yellowish; pile mostly blackish above, yellowish on the border. Pleuræ with more abundant yellowish pile. Abdomen shining greenish black; the usual triangular spots on the second segment sometimes yellowish, usually metallic shining, not contiguous in the middle, elsewhere the color is opaque velvety black with a shining metallic spot in the middle behind; third segment with three opaque spots, an elongate one on each side behind, and an oval median one in front, sometimes there is a yellowish spot on the sides; fourth segment with an oval median opaque spot in front; hind margin of the second, third, and fourth segments yellow, sometimes nearly obsolete; pile very short, on the first segment longer, whitish, on the opaque portion black, elsewhere more yellowish. Legs black; basal portion of all the tibiæ yellowish white. Wings hyaline, small stigmatic spot brown, a brownish tint often near the middle of the wing.

Fifteen specimens, Connecticut, District of Columbia (Patton), White Mountains (Dimmock, 1447), Kansas.

About the synonymy of *L'Herminieri* and *chalybeus* there can be no doubt, the descriptions agree perfectly, and Osten Sacken, who examined the types, pronounced them to be the same. *E. niger* and *incisuralis* of the same author differ only in that the opaque spots of the third abdominal segment are not mentioned; nevertheless, the synonymy is not doubtful.

Eristalis saxorum.

Eristalis saxorum Wiedemann, Auss. Zw. Ins., ii, 158; Macquart, Dipt. Exot., ii, 2, 33, 5.

Eristalis pervagus Walker (Harris), List, etc., iii, 618.

Habitat.—Massachusetts, Connecticut, North Carolina, Pennsylvania! Georgia.

♂, ♀. Length 10 to 13^{mm}. Resembles *dimidiatus*, but is at once distinguishable by the third segment of the abdomen having an entire posterior, velvety cross-band, by the front in the female being narrowed above, and by the presence of a distinct brown spot on the wings.

Face concealed beneath dense whitish or yellowish pollen and whitish pile, concave below the antennæ; a large oval spot connected with the narrow oral margin, and the cheeks, shining black. Front in female distinctly narrowed toward the vertex, at the narrowest part only a little more than half as wide as at the base of the antennæ; in well-preserved specimens dusted on the sides, more lightly in the middle, leaving the vertex and just above the antennæ shining, in the middle a slender brown stripe and above on each side an oval black spot; pile above blackish, below whitish. Frontal triangle with longer yellowish pile; shining in the middle. Eyes nearly bare, the pile being short and confined to the upper part. Antennæ brownish black, third joint somewhat reddish; arista red, briefly pilose toward the base. Thorax a deep blue black, shining; pile light yellowish, short, not abundant, but more so on the pleuræ. Scutellum scarcely reddish above. Abdomen shining bluish black; the second segment on the sides sometimes yellowish, and in the same specimens similar, but more faintly colored spots on the sides of the third segment; the shining fascia of the second segment interrupted in the male, entire in the female, in front narrowly, behind broadly opaque black, without a shining triangular spot; third segment very narrowly in front, more broadly behind with entire velvety fasciæ; fourth segment with a black fascia behind; fifth segment in female and the hypopygium in male wholly shining; the second, third, and fourth segments very narrowly yellow behind. Legs black; the base of hind femora in the female and sometimes so in the male, the basal half of anterior and posterior tibiæ, rather more than half of the middle tibiæ, and the basal joints of the middle tarsi, yellow. Wings hyaline, the immediate base, and a large spot near the middle covering the cross-veins, brown; in some specimens the brown of the middle is confined to a narrow fascia across the base of the discal cell and origin of the third vein.

Thirty specimens.

Eristalis latifrons.

Eristalis latifrons Loew, Centur., vi, 65.

Eristalis stipator Osten Sacken, West. Dipt., 336; Williston, Proc. Am. Phil. Soc., xx, 319.

Habitat.—California, Kansas, Arizona, Colorado, New Mexico, Texas!

♂, ♀. Length, 9 to 14^{mm}. Face a little concave below the antennæ, concealed beneath dense yellowish-white pollen, and the pile of the same color; in the middle with a rather broad shining bare stripe; the cheeks also bare and shining black. Antennæ black, third joint brownish-black; arista reddish yellow, bare. Eyes pilose, contiguous in the male, the suture between them rather short (about half as long as the interval between the apex of the frontal triangle and the root of the antennæ); front in female rather broad, the sides a little convergent above, grayish pollinose, beset with dense grayish-white pile, shining along the middle, especially below, the vertex darker. Thorax greenish-black, unicolorous, shining, beset with yellow or yellowish pile, sometimes more orange-colored, denser on the pleuræ. Scutellum reddish-brown, translucent; second abdominal segment with a yellow triangle of the usual shape on each side, sometimes brownish-yellow; an opaque black cross band on the anterior margin, another one along the posterior side of the yellow triangles; the latter is interrupted or subinterrupted in the middle, oblique on each side, and not reaching the lateral margins; a smooth bluish-black space is inclosed between the two cross-bands and the triangles; a narrow shining triangular space between the hind cross-band and the yellowish-white posterior margin of the segment, which bears a fringe of pale golden-yellow pile; the third and fourth segments have the same pale-yellowish posterior margin and fringe of pale-golden pile; on the fourth segment, however, the fringe is broader, and takes in the whole posterior half of the segment; on the posterior half of the third segment there is on each side in the male usually an elongated opaque black streak; the anterior margin of the third segment has a narrow pale border, as if prolonging the hind margin of the preceding segment. Hypopygium black. Legs black; tip of the femora and basal half of the tibiæ yellowish-white; on the middle pair three-fourths of the tibiæ and the base of the tarsi are of a pale color. Wings hyaline; stigma small, brown.

Six specimens from California (Morrison), the male of which lacks the velvety lateral spots on the third segment; a single male from Western Kansas and a female from Topeka, Kans. (Popenoe); also, seven males and three females from Colorado and five from Arizona (Professor Comstock). Since writing the above I have found the species very abundant on the Kansas plains in August.

Eristalis Brousi.

Eristalis Androclus Osten Sacken (not Walker), West. Dipt., 337; Cat. Dipt., note 223, p. 249.

Eristalis ? Meigenii (Wied.) Williston, Proc. Am. Phil. Soc., 319 (male).

Eristalis Brousii Williston, ibid., 323 (female).

Habitat.—Canada, New England, Washington Territory !, Utah, Alaska (O. S.).

♂, ♀. Length, 10 to 12^{mm}. Face black, shining, thickly clothed with yellow pollen and pile, leaving the tubercle, the oral margin, and the cheeks shining black. Frontal triangle a little shining along the middle; in the female the front reddish pollinose, more shining above the antennæ. Antennæ black, third joint somewhat reddish; arista reddish, briefly pilose near the base. Eyes pilose, in the male contiguous for a short distance only; posterior lateral orbits white-pollinose. Thorax black, shining, on the dorsum with a coppery luster, leaving two opaque, lighter colored, rather broad stripes, reaching from the front to the scutellum, limited by three narrow, opaque, black stripes; pile of dorsum light reddish yellowish, scarcely apparent from above; pile of the pleuræ whitish. Scutellum subtranslucent yellowish or reddish on the outer part. Abdomen in the male as follows: first segment black; second segment orange-yellow, broadly on the sides and narrowly across on the hind border, elsewhere opaque black; on the posterior part the black includes nearly a third of the width of the segment; the sides approach each other a little towards the front and then at nearly right angles extend outward along the anterior margin of the segment; the lateral prolongations are convex on their hind borders and reach acutely nearly to the lateral margins; third segment with large, similar colored spots, confluent with the yellow in front, but rounded on the internal posterior angles and usually not quite reaching the yellow of the hind margins; across the middle of the segment a shining metallic band interrupted in the middle, elsewhere the black is opaque; fourth segment wholly shining, with a narrow yellow hind margin and sometimes with a small spot of opaque black in front; hypopygium shining black. In the female the markings are rarely like those of the male, chiefly shining black; the second segment sometimes with a small reddish spot on the side, the opaque marking as in the male; the third and fourth segments sometimes with a small opaque spot in front; second, third, and fourth segments sometimes rather broadly whitish pollinose on the hind border; the hind margins more narrowly reddish-yellow. Legs black, a little stout; tip of femora and base of tibiæ reddish or whitish yellow. Wings hyaline; stigma minutely brownish; in the female with a large faint brownish spot.

Twelve male and six female specimens from Connecticut and an equal number from New York and Pennsylvania; also one male from Toronto (Brodie) and one from Washington Territory (Professor Hagen).

This species is remarkably like *E. arbustorum* from Europe in size, shape, and coloration, but a careful examination discloses differences which are evidently specific. With *E. Meigenii* Wied. (Auss. Zw. Ins., ii, 177; pl. xv, fig. 15), from South America, the resemblance must be even greater; the full descirption applies almost perfectly.

Osten Sacken observes that the specimens from Yukon River, Alaska, have the arista dark and the velvety spots on the abdomen somewhat different.

Eristalis montanus.

Eristalis montanus Williston, Proc. Am. Phil. Soc., xx, 322.

Habitat.—Wyoming!

♂. Length, 11 to 12^{mm}. Face reddish-yellow pollinose, and white pilose, on the sides; the median stripe and broadly on the cheeks shining black. Frontal triangle black in the middle, with yellowish pile. Antennæ black; arista reddish, pubescent near the base. Eyes wholly pilose; approaching each other in front of the ocelli, but not quite contiguous. Face distinctly concave below the antennæ. Thorax clothed with long and dense sulphur-yellow pile; from above, the ground color appears black. Scutellum wholly yellow, densely yellow pilose. Abdomen with abundant, long, reddish-yellow pile; first segment black, second segment broadly shining reddish-yellow, in the middle opaque black, the black is broad in front, behind it occupies less than a fourth of the width of the segment; third segment of the same reddish-yellow color, shining; the median broad black stripe, continuous with the black of the second segment, is opaque in front, shining behind; fourth segment similar to the third, but the black wholly shining; hypopygium shining black. Legs black, with black pile; tibiæ yellowish at the base. Wings nearly hyaline; stigmatic spot dark brown; a broad, distinct, brownish spot in the middle of the wing.

One specimen, Como, Wyoming, altitude 7,000 feet.

It is probable that the amount of yellow on the abdomen may vary, especially on the third and fourth segments.

Eristalis occidentalis.

Eristalis occidentalis Williston, Proc. Am. Phil. Soc., xx, 322.

Habitat.—Washington Territory!

♂, ♀. Length, 10 to 12^{mm}. Allied to *Bastardi* and *montanus*. Face clothed with reddish-yellow pile and pollen, not at all concave below the antennal process; median stripe and cheeks bare, shining black. Antennæ black; arista red, pubescent near the base. Eyes pilose; contiguous for a short distance (♂). Front in the female a little narrowed above; thickly yellowish pollinose and with abundant yellow pile, near the vertex black. Thorax opaque black, with long yellow pile, apparently more abundant in the male, but not concealing the ground color when seen from above; in the female on the front part in the middle with two narrow grayish stripes, abbreviated posteriorly. Scutellum yellow, with more abundant yellow pile. Abdomen black, with abundant, rather long, yellow pile; first segment black; second broadly yellow on the sides, the black opaque portion broadly along the front margin, a third of the width of the segment behind; third segment yellow on the sides, with a shining interrupted transverse fascia, the black elsewhere opaque; fourth segment shining black with a small opaque spot in front, sometimes reddish on the sides in front; second, third, and fourth segments with a narrow yellow hind margin. In the female the yellow is apparently less extensive; on the second segment forming large triangular spots; on the third nearly or quite wanting, the shining fascia entire. Legs black; base of all the tibiæ whitish-yellow, the first two joints of the middle tarsi yellowish. Wings hyaline; a distinct brownish spot at the middle.

Six specimens, Washington Territory.

This species is evidently variable in the abdominal markings. It must be allied to *pilosus* from Greenland, though certainly different.

Eristalis Bastardi.

Eristalis Bastardii Macquart, Dipt. Exot., ii, 2, 35, 7; pl. ix, fig. 1.
Eristalis semimetallicus Macquart, Dipt. Exot., 4e suppl., 140, 65.
Eristalis nebulosus Walker, List, etc., iii, 616.

Habitat.—New England, Canada, Labrador!

♂, ♀. Length, 11 to 12$^{\mathrm{mm}}$. Eyes pilose, contiguous in the male. Face and front concealed beneath reddish-yellow pollen and yellow pile, the facial stripe and cheeks shining black. Vertex with black pile. Antennæ black; arista shortly and thinly pilose. Thorax with abundant bright yellow pile, sparser across the disk, where it is sometimes mixed with black; the deep opaque black ground color is apparent from above in large part. Scutellum light yellow, with pile like that of the thoracic dorsum. Abdomen: first segment black with yellow pile; second segment on the sides with a rather small red spot, sometimes obscure and not quite reaching the lateral margin; clothed on the sides with yellow pile; the black wholly opaque with thick black pile, often more or less intermixed with yellow. Third segment usually wholly black, but in some northern specimens broadly red on the sides, across the middle with a shining fascia, in front and behind opaque, but not readily perceived, owing to the dense black pile, which is not infrequently intermixed more or less with yellow, especially on the sides; remainder of the abdomen wholly bright shining, usually clothed with longer yellow pile, but sometimes the yellow is mainly confined to the sides. Legs black with black pile; basal portion of all the tibiæ yellow. Wings hyaline with a large brown spot in both sexes, sometimes rather faint. Numerous specimens.

A common species in the New England States. Osten Sacken gives the synonymy of *nebulosus* from an examination of the type. The type of *semimetallicus* he also examined and believed it to be the same; though it might possibly be an allied species. Macquart's description certainly applies closely to some individuals, and it seems to me that it is unquestionably a *Bastardi.*

Eristalis flavipes.

Eristalis flavipes Walker, List, etc., iii, 633.
Eristalis melanostomus Loew, Centur., vi, 69.
Milesia barda Say, J. Acad. Phil., vi, 163; Compl. Wr., ii, 357 (female).

Habitat.—Canada, New England, Washington Territory!, Minnesota (Loew).

♂, ♀. Length, 13 to 17$^{\mathrm{mm}}$. Large, shining, robust, black, thickly pilose. Face and cheeks shining black, a little yellowish dusted near the antennæ, on the sides very sparsely whitish pilose. Eyes broadly contiguous in the male, their pile chiefly confined to a dense vertical stripe. Frontal triangle yellow pollinose and with abundant yellow pile; in the female the front is broad above, thickly reddish-yellow pollinose and with abundant yellow pile, above the base of the antennæ somewhat shining. Antennæ brownish-black, often somewhat reddish, arista thinly plumose on the basal portion. Dorsum of thorax, pleuræ, and scutellum, with very abundant and long bright yellow pile, less abundant on the disk of the dorsum, where the deep black ground color is apparent, and the pile also frequently more or less intermixed with black, sometimes broadly and conspicuously black (var. *melanostomus* Lw.). Scutellum wholly light yellow. Abdomen deep black, everywhere shining; on each side of the middle of the second segment frequently the ground color is deep reddish; pile dense, in color black and yellow variable, usually on the first segment, and more or less on the second, longer yellow; sometimes the yellow, with a reddish cast, covers the entire abdomen except the tip, the fifth segment usually yellow pilose. Legs deep black, with black pile; knees reddish, anterior tarsi brown, middle and posterior pairs conspicuously light reddish-yellow, except their tip, hind femora somewhat elongate, hind tibiæ bent. Wings hyaline, veins luteous, in the female with a large brown spot.

A very common and fine species, in appearance strikingly resembling *Mallota posticata.* Thirty specimens.

Eristalis compactus. (Plate VII, fig. 9.)
Eristalis compactus Walker, List, etc., iii, 619.
Eristalis atriceps Loew, Centur., vi, 64.

Habitat.—Hudson Bay Territory (Walk.), White Mountains, Canada (Lw.), Connecticut!

♂, ♀. Length, 9 to 10^{mm}. Black, shining. Face on the sides lightly covered with whitish pollen and thin whitish pile. Front in female yellow pilose below; on the sides lightly pollinose above, clothed with black pile. Antennæ red, third joint unusually large; arista bare. Eyes wholly lightly pilose. Dorsum of thorax shining, with reddish pile on the sides, more obscure in the middle. Pleuræ mostly black pilose; scutellum brownish red with black pile, along the border the pile is reddish. Second segment of the abdomen on the sides with the usual triangle red, or brownish red, and, extending across between, a shining fascia, not interrupted in the middle, the black elsewhere deep opaque, hind border yellow; third segment and also the fourth, except their yellow hind border, wholly shining, the posterior part of the third segment, however, less distinctly so, subopaque; hypopygium, or fifth segment, wholly shining. Pile on the sides of the segments reddish, along the lateral margins on the front part of the segments whitish, and at the tip of the abdomen intermixed with light-colored pile, on the black portions short, thick, black. Venter black, shining, with long, whitish pile, the posterior margins of the segments whitish. Legs reddish, black pilose, hind femora not thickened, basal part of femora and last three joints of tarsi black, the distal end of anterior and posterior tibiæ more or less brownish, the tibiæ at the base yellow. Wings hyaline, veins black; the anterior part as far as the cross-vein, and reaching a little into the base of the second basal cell, brown.

A single specimen, taken June 15 in Connecticut, agrees quite with Loew's description, except that the femora are in a greater degree reddish. In Walker's specimen that he described, the legs were wholly ferruginous, except the tip of tarsi. The color of the femora is evidently variable, and I have no doubt that the present is, as Baron Osten Sacken suspected, Walker's species. The species will be easily recognized by the blackish marking along the fore border of the wing.

Eristalis transversus. (Plate VII, fig. 8.)

Eristalis transversus Wiedemann, Auss. Zw. Ins., ii, 188, 51.
Eristalis philadelphicus Macquart, Dipt. Exot., ii, 2, 34, 6; pl. viii, fig. 4.
Eristalis pumilus Macquart, Dipt. Exot., ii, 2, 57, 43.
Eristalis vittatus Macquart, Hist. Nat. Dipt., i, 307, 19.
Eristalis zonatus Bigot, Ann. Soc. Ent. France, 1880, 217.

Habitat.—Atlantic States!

♂, ♀. Length, 7 to 12^{mm}. Eyes pilose on upper half, broadly contiguous in the male. Frontal triangle black, shining in the middle, pollinose on the sides, the pile black; front in female with black pile, narrowed above, on the lower two-thirds reddish pollinose, just above the base of the antennæ shining black, around the ocelli also somewhat pollinose, below the ocelli velvety black, extending downwards into three points, one along each eye and one in the middle. Antennæ reddish yellow, the first two joints and the upper part of the third often brownish or blackish; arista reddish, the basal portion sparsely plumose. Face concealed on the sides beneath dense whitish pollen and whitish pile, the median stripe and cheeks shining black. Dorsum of thorax opaque black, with three grayish olivaceous transverse bands, the first along the front border, the second just before the suture, the third midway between this and the scutellum; pile not at all abundant, lutescent, on the pleuræ more abundant, yellow. Scutellum bright yellow, along its base narrowly black. Abdomen in the male as follows: first segment black; second segment with large lateral triangles, and narrow posterior border, bright yellow, elsewhere wholly opaque black, extending narrowly to the lateral margins; third segment with a large quadrilateral spot on each side in front, and posterior border, yellow, the black is opaque, except a narrow shining cross-band that cuts off a small opaque spot in front; fourth segment with a small yellow spot on each anterior angle, and a posterior yellow border, broader than on the preceding, remainder of the segment opaque black with an entire shining cross-band before the middle of the segment; hypopygium shining black. In the female the lateral spots of the second segment are smaller, the second, third, fourth, and fifth segments with a narrow yellow hind border and an entire, or subinterrupted shining cross-band on the anterior part of each segment; on the third and fourth segments sometimes with a small yellow spot on the sides in front. Legs variable; usually black with the tip of femora and base of tibiæ yellow; at other times the distal half of all the femora and the base of hind tibiæ, femora, and the larger portion of the tarsi yellow; more rarely the front and middle legs may be almost wholly yellow and the black confined to outer part of hind femora, tip of hind tibiæ, and tip of all the tarsi. Wings hyaline, the basal portion a little yellowish.

I have examined a large number of specimens of this species collected mostly in New England, and believe the synonyms as given to be correct. Small specimens corresponding to *pumilus* were taken late in October, and, upon first sight, certainly seemed a different species, but a further study showed the impracticability of separating them from the more typical *transversus*. Altogether I have examined about 75 specimens, collected from Canada to Florida.

Eristalis vinetorum. (Plate VII, fig. 8*a*.)

Syrphus vinetorum Fabricius, Ent. Syst., Suppl., 562.
Eristalis vinetorum Fabricius, Syst. Antl., 235, 13; Wiedemann, Auss. Zw. Ins., ii, 163, 15; Macquart Dipt. Exot., ii, 2, 41, 16.
Eristalis trifasciatus Say, J. Acad. Phil., vi, 165; Compl. Wr., ii, 359.
Eristalis uvarum Walker, List, etc., iii, 623.
Eristalis thoracicus Jaennicke, Neue Exot. Dipt., 91.

Habitat.—Cuba, Florida, Georgia, Mexico!, Indiana (Say), Pennsylvania (O. S.), Brazil (Schiner).

♂, ♀. Length, 11 to 14^{mm}. Antennæ reddish-yellow; arista bare. Face reddish-yellow; on the sides with whitish pollen and pile; the median stripe and cheeks shining, more or less brownish. Frontal triangle, like the face, clothed wholly with white pile; front in female narrow above, more yellowish than the face, in the middle with a brownish stripe; above with blackish pile near the ocelli, below yellowish-white. Dorsum of thorax opaque black, with three distinct grayish-olivaceous fasciæ, the first on the front border, the second just before the suture, and the third, the broadest, just in front of the scutellum, the intervals between them crescentric; pile short, yellowish; pleuræ grayish pollinose. Scutellum reddish-yellow, lighter along its border. Abdomen in the male as follows: first segment black, on the sides reddish-yellow; second segment with large lateral spots, not reaching the hind border, the opaque black very narrow between the tips of the side spots, broader in front, and reaching across the segment in front of the narrow yellow hind border; third segment with a large spot in front on the sides, usually more reddish, and a narrow yellowish hind border; across the middle a shining entire band, leaving an opaque black spot in front and a similar colored fascia behind; fourth segment with a shining cross-band in front, opaque behind, posterior border more broadly yellow; hypopygium shining black. In the female the yellow spots on the third segment are usually smaller or wanting. Pile on the opaque portions black, elsewhere yellowish. In some specimens the abdomen is ferruginous on the shining parts, and the opaque portions of a deeper color. Legs: anterior and middle pairs yellowish or reddish, the base of femora and tip of tibiæ brownish, hind femora considerably dilated, usually broadly blackish, sometimes deep red, distal half of hind tibiæ blackish. Wings hyaline, basal portion a little yellowish.

Ten specimens, Florida (Professor Riley), Georgia, Cuba.

Eristalis albiceps.

Eristalis albiceps Macquart, Dipt. Exot., ii, 2, 56, 41; Osten Sacken, Cat. Dipt., 131, note 221.
Eristalis seniculus Loew, Centur., vi, 63.

Habitat.—Carolina (Macq.), Cuba (Loew), Florida, San Domingo!

♂. Length, 8 to 9mm. Black, opaque. Eyes pilose, contiguous in male. Face concealed beneath white pollen and thick pure white pile, more abundant and conspicuous on the frontal triangle. Facial stripe and cheeks shining black. Antennæ obscurely reddish or ferruginous; arista bare. Dorsum of thorax clothed with yellowish-white pile in front, intermixed with blackish behind; in front of the suture with a conspicuous grayish pollinose fascia, and on each side with an oblique spot reaching from the root of the wing backward toward the scutellum. Scutellum yellow, base narrowly black, pile black. First segment of abdomen black, outer angles yellow; second segment light yellow, with a narrow median opaque black stripe not quite reaching the hind margin, a little broader in front, where it connects with the semicircular black below the scutellum; third segment with an oval reddish yellow spot on each side, confluent with the yellow of the preceding segment, the hind border yellow, the black deep opaque without any shining spot or fascia; fourth segment with a yellow hind border, and a narrow interrupted shining fascia dilated on the sides; hypopygium shining black with light pile; pile on the opaque portions black, on the yellow spots yellow. Legs black; hind femora dilated; knees, basal third of front and hind tibiæ, basal half of the intermediate tibiæ, and the middle metatarsi, light yellow, the extreme base of the anterior metatarsi luteous. Wings hyaline, sometimes faintly clouded in the middle and outer parts; near the end of the marginal cell there is a distinct curvature of the second vein into the submarginal cell.

♀. Differs in the presence of a complete grayish band on the dorsum of the thorax in front of the scutellum, in the second segment of the abdomen being broadly opaque black in the middle, narrower in front and extending as a fascia to the lateral margin of the abdomen behind; the third and fourth segments have each, also, a narrow, interrupted shining fascia, and the lower part of the front is not wholly white pilose.

Baron Osten Sacken, after an examination of the type of *albiceps*, states that it looked like *seniculus* of Loew. Macquart's description applies sufficiently closely, except the "yeux nus," which is probably an error, such as he has also made in regard to other North American species of this genus. The description of *seniculus* applies fully to the specimens which I have from Florida (two, Dr. Whitfield), Georgia (two, Professor Riley), and San Domingo (three, Mr. G. F. Frazar).

Eristalis hortorum. (Plate VII, fig. 10.)

Musca surinamensis Degeer, vi, 145; tab. xxix, fig. 1.
Syrphus hortorum Fabricius, Syst. Ent., 764, 11; Ent. Syst., iv, 286, 29.
Eristalis hortorum Fabricius, Syst. Antl., 236, 16; Wiedemann, Auss. Zw. Ins., ii, 169.

Habitat.—West Indies!

♂. Length, 12^{mm}. Antennæ orange-yellow, arista bare. Face and front orange-yellow, thickly covered with yellow pollen and pile; face with a shining yellowish red stripe, not very broad; cheeks with a shining black stripe. Eyes pilose, contiguous. Thoracic dorsum black, shining behind; front margin grayish pollinose, separated by a black band from the rather slender yellowish-grayish band on the suture; in front of the scutellum rather broadly yellowish-grayish pollinose, separated, or nearly so, from a similarly colored spot along the post-alar callus. Pleuræ thickly white pollinose below, above with golden yellow pile. Scutellum wholly yellowish-red. Second segment of abdomen on each side with a large yellowish-red triangle, broadly separated by opaque black, which extends out narrowly nearly to the lateral margin behind; posterior margin yellow; pile behind black, elsewhere yellow. Third segment wholly shining, with black pile, except on the lateral margins; fifth segment shining metallic, with golden-yellow pile, posterior margin yellow, and just before it a narrow transverse opaque black fascia. Hypopygium wholly shining black, with golden-yellow pile. Legs yellowish-red, base of four front tibiæ light yellow; hind femora considerably thickened, hind tibiæ compressed, in front and behind with a fringe of black pile. Wings on the posterior portion hyaline, in front on the basal portion yellow, from before the cross-veins to near the tip and beyond the middle dark brown.

Four specimens, San Domingo (G. F. Frazar).

Eristalis atrimanus.

Eristalis atrimanus Loew, Centur., vi, 62.

Habitat.—Cuba (Lw.), San Domingo!

♂. Length, 12^{mm}. Black, opaque. Eyes pilose, broadly contiguous. Face thickly clothed with yellowish-white pollen and pile, median stripe and the cheeks bare, black and shining. Antennæ blackish, arista bare. Frontal triangle black, shining in the middle and clothed with black pile, along the edge narrowly white pollinose. Dorsum of thorax on the anterior margin cinerescent, across the suture with a transverse, yellowish-white pollinose band; anterior part of the dorsum with yellow pile, posterior part with black pile. Scutellum ochraceous yellow; pile chiefly yellow, the remainder black. First abdominal segment black, the lateral angles yellow; second, with two large yellow spots touching the front margin in their whole length, rather narrowly separated in the middle and extending on the sides nearly to the hind margin, their inner ends convex from the front border of the segment; the black is wholly opaque, extending narrowly to the lateral margins; third segment with two large yellow spots, leaving the black similar to that of the preceding segment, but extending a little more broadly to the lateral margins, and more rounded in front; fourth segment opaque black, with a slender, narrowly interrupted, metallic cross-band; hind margins of the second, third, and fourth segments yellow; hypopygium shining black, with yellow pile; elsewhere the pile on the black portions is black, on the yellow parts yellow. Legs black; tip of four front femora, basal third of four front tibiæ, and narrow base of hind tibiæ, yellow; hind femora but slightly thickened. Wings hyaline.

♀. Front with a broad median black stripe, entire, black pilose, on the sides concealed beneath yellowish pollen and whitish pile. Second segment of the abdomen with the yellow not extending so far backward and more narrowly separated; third segment wholly without yellow, on each side with a shining spot.

Three males and one female, San Domingo (G. F. Frazar). I believe my identification of this species is correct, but I do not observe any pollinose spot near the post-alar callus as Loew describes.

Eristalis pilosus.

Eristalis pilosus Loew, Centur., vi, 70.

Habitat.—Greenland (Lw.)!

♂, ♀. Length, 11 to 13^{mm}. Black, thickly clothed with long yellow pile; eyes black pilose; antennæ black, arista bare; face black; thorax unicolorous, opaque; scutellum luteous; first two abdominal segments opaque; the second on each side with a dilutely lutescent spot; third black, with two opaque spots, confluent in an abbreviated fascia; two ultimate segments bronze-black, shining, with a minute triangular spot opaque; pile of the dorsum reddish, on the sides of the middle black, remainder yellow; wings pure hyaline, veins fuscous-black, in the female with a blackish spot.

Black, clothed with long yellow pile, sometimes lighter. Head black, yellow pilose; face of the same color, and, except the very broad median stripe, is thinly covered with yellowish pollen; eyes in both sexes black pilose, in the male contiguous, in the female broadly separated. Antennæ black, arista bare. Thorax unicolorous, opaque; pile wholly yellow. Scutellum dilutely lutescent, very thickly yellow pilose. First two segments of the abdomen opaque; second on each side with a subrotund spot, very dilutely lutescent, on the posterior margin smooth. Third segment shining, with two opaque spots, forming an abbreviated fascia. The remaining segments are bronze-black, shining, except a minute triangular spot, situated near the margin of the fourth segment. Pile of the abdomen yellow, in the middle of the abdomen reddish, near the tip sometimes pallid, on the posterior angles of the second segment, and the lateral margins of the third segment, except the angles, black. Legs black, black pilose; hind femora slender, narrow base of the tibiæ fuscous. Wings pure hyaline, veins fuscous-black, veins of the disk in the female clouded with blackish.

Translation from original, compared with the types.

Eristalis obscurus.

Eristalis obscurus Loew, Centur., vi, 67.

Habitat.—Red River of the North (Loew)!

♂. Length 10 to 11mm. Bronze-black, shining, clothed with rather long, dilutely lutescent-cinereous pile; front broad, above black pilose; eyes pilose. Antennæ reddish-ferruginous, first two joints black; arista pilose; face, except the usual stripes, yellowish-red, white pollinose and white pilose. Scutellum brown, black near the base. Each abdominal segment, except the first, with a posterior black fascia, not emarginate, and with a very slender posterior yellow margin. Legs black; tip of all, and base of hind, femora, the basal third of front and hind tibiæ, middle tibiæ, except the tip, and the first two joints of all the tarsi, light yellowish. Wings pure hyaline, veins of the disk clouded with fuscous.

Similar to *E. dimidiatus*. Bronze-black, shining, clothed with rather dilutely lutescent-cinereous pile. Front broad, concolorous, above black pilose, a median spot on the front margin reddish, the lateral margins in front white pollinose. Face yellowish-red or red, white pollinose and white pilose, median stripe black, rarely pitchy, oral margin and the cheeks always black. First two joints of the antennæ black, third red or ferruginous-red, rarely obscurely fuscous; arista pilose. Thoracic dorsum neither striped nor fasciate. Scutellum pitchy or brown, near the base always metallic black. First segment of the abdomen glaucous, white pilose; second segment with two velvety fasciæ, separated by a shining fascia which is much dilated on the sides; the posterior margin yellow. In the following segments, besides the very slender yellow hind margin, with a posterior opaque black fascia, that on the third segment velvety, on the remaining segments moderately shining. Pile on the posterior part of each segment black, on the front portions in great part cinerescent. Legs black, pallidly pilose; hind femora slender, near the base yellow; tip of all the femora, basal third of front and hind, and the middle tibiæ except the tip, and the first two joints of all the tarsi, light yellow, the second joint near its tip blackish. Wings pure hyaline, the disk clouded with fuscous, stigma and immediate base fuscous.

Translation from the original, compared with the type at Cambridge.

Eristalis inornatus.

Eristalis inornatus Loew, Centur., vi, 68.

Habitat.—Red River of the North (Lw.)!

♀. Length 13mm. Submetallic black, shining, clothed with rather long lutescent pile; front broad, near the ocelli black pilose, but the vertex itself with luteous pile. Eyes pilose. Antennæ reddish-ferruginous, the first two joints black; arista pilose. Face, except the usual stripe, yellow, with dilutely lutescent pile and pollen. Scutellum wholly reddish. Each segment of the abdomen, except the first, with a black posterior fascia, on the second and third emarginate and velvety opaque, on the following sub-shining; posterior margins of the segments very narrowly yellow. Legs black; extreme tip of the femora, the basal half of front and hind tibiæ, the middle tibiæ except the distal third and the first joint of the middle tarsi, light yellowish. Wings hyaline, the veins of the disk broadly subfuscous clouded.

Somewhat bronze-black, shining, clothed with rather long lutescent pile. Front broad, concolorous, with thick luteous pile, near the ocelli black pilose, on the sides anteriorly luteous pollinose, the anterior margin above the antennæ reddish. Face longer than in *E. obscurus* and the tubercle smaller, concealed beneath dilutely lutescent pollen, and clothed with the same colored pile, a rather slender median stripe and the cheeks black. First two joints of antennæ black, third reddish-ferruginous; arista pilose. Thorax unicolorous, moderately shining, wholly luteous pilose, the pile of the pleuræ, however, lighter colored. Scutellum reddish, luteous pilose. First abdominal segment glaucous, remaining segments shining, posterior margins of the second, third, and fourth segments narrowly yellow. On the second segment there are two velvety-black fasciæ, one on the anterior margin and attenuated on the sides, the other touching the posterior margin and emarginate; third segment with similar fasciæ, but the anterior one is more slender. Last two segments wholly shining, near their posterior margins a deeper black. Pile of the abdomen chiefly black, on the first segment white, on the front half of the second segment and near the anterior angles of the intermediate segments pallid lutescent, on the ultimate segments pallid, intermixed with black. Legs black, light yellow pilose, hind femora slender; tip of the femora, front and hind tibiæ at their base, middle tibiæ, except the tip, and the first joint of the middle tarsi with the base of the second joint, light yellowish. Wings hyaline, veins black-fuscous, near the base of the wings reddish, a large, dilutely subfuscous spot on the disk, stigma minutely black-fuscous.

"The type specimen has the abdomen somewhat rubbed, so that it is difficult to judge correctly of the pile."—Loew.

Translation from the original. The single type specimen at Cambridge is in poor preservation. The species is allied to ***dimidiatus***.

Eristalis oestriformis.

Syrphus oestriformis Walker, List, etc., iii, 573.
Eristalis oestriformis Osten Sacken, Cat. Dipt., 131, note 227, p. 249.

Habitat.—Hudson's Bay Territory (Walk.).

"Mas. Niger, thoracis pilis anticis nigris posticis fulvis, scutello fulvo, abdomine pilis albis nigris fulvisque fasciato, antennis piceis, pedibus nigris, alis limpidis fusco unimaculatis.

"Body black: head clothed with dull tawny hairs, shining and prominent in front: mouth pitchy: feelers pitchy: bristle ferruginous, downy: eyes pitchy, each with a broad stripe of short black hairs: all the facets very small: chest clothed with short black hairs, and on the hinder part with pale tawny hairs; scutcheon tawny, very thickly clothed with pale tawny hairs: abdomen nearly oval, broader and a little longer than the chest, clothed with white hairs at the base, with black hairs in the middle, and with bright tawny hairs towards the tip: legs black, clothed with short black hair: knees pitchy: shanks and feet clothed beneath with tawny down: hind feet tawny: claws and foot cushions tawny: tips of claws black: wings colorless: large dark brown spot in the disk: wing ribs pitchy: veins black, ferruginous towards the base and along the free borders: poisers ferruginous. Length of the body 7 lines; of the wings [spread] 14 lines."—Walker.

"*Syrphus oestriformis* Walker is a rather peculiar Eristalis, represented by a single specimen in the British Museum."—Osten Sacken.

Eristalis parens.

Eristalis parens, Bigot, Ann. Soc. Ent. Fr., 1880, 216.

Habitat.—North America (Bigot).

♂. Long. 13$^{\mathrm{mm}}$. Oculis hirtis, cheto basi breviter villoso (*E. arbustorum* simillimo). Antennis castaneis; facie nigra, utrinque cinereo obscuro villosa; thorace nigro, dense fulvo velutino; scutello fulvo; calyptris testaceis; abdomine, segmento secundo, utrinque, macula lata, trigona, fulva, tertio maculis simillimis, sed angustioribus, cunctis anguste fulvo marginatis; femoribus obscure castaneis, geniculis et tibiis pallide testaceis, apice late castaneis, tarsis obscure rufis, apice parum infuscatis; alis fere hyalinis, basi, et, extrinsecus, dilute et pallidissime infuscatis.

Resemble à l'arbustorum. Yeux velus, chète brièvement velu à sa base. Antennes brunâtres; face noire, couverte, de chaque côté, par un duvet grisâtre; thorax noirâtre, couvert d'un duvet roussâtre assez dense, flancs à poils roussâtres; écusson d'un testacé foncé; cuillerons testacés; abdomen d'un noir luisant, presque nu, tous. les segments finement bordés de fauve, base du 1er à poils grisâtres, 2^{e} et 3^{e}, de chaque côté, avec une macule fauve, triangulaire, beaucoup plus étroite sur le 3^{e}, ventre d'un gris jaunâtre; pieds d'un brun rougeâtre avec un fin duvet gris, genoux et tibias, à la base, d'un testacé blanchâtre devenant plus foncé vers leurs extrémités; ailes presque hyalines, nervures, base, bord externe, d'un roussâtre très-clair.—Bigot.

ADDITIONAL NORTH AMERICAN SPECIES.

Eristalis agrorum Fabricius, Ent. Syst., iv, 285, 27 (*Syrphus*); Syst. antl., 235, 12; Wiedemann, Auss. Zw. Ins., ii, 172, 28.—Guadeloupe.

Eristalis albifrons Wiedemann, Auss. Zw. Ins., ii, 189; Röder, Stett. Ent. Zeit., 1885, 340.—Porto Rico.

Eristalis Bellardii, Jænnicke, Neue Exot. Dipt., 92.—Mexico.

Eristalis cubensis Macquart, Dipt. Exot., ii, 2, 42, 19.—Cuba.

Eristalis diminutus Walker, List, etc., iii, 622.—Mexico.
Eristalis expictus Walker, Trans. Ent. Soc. N. Ser., v, 291.—Mexico.
Eristalis familiaris Walker, Trans. Ent. Soc. N. Ser., v, 290.—Mexico.
Eristalis fulvipes Bigot, Ann. Soc. Ent. de Fr., 1880, 225.—Mexico.
Eristalis furcatus Wiedemann, Auss. Zw. Ins., ii, 176, 34.—Brazil, Columbia, Yucatan.
E. femoratus Macquart, Dipt. Exot., ii, 2, 40, 15; tab., ix, fig. 6.
Eristalis guadalupensis Macquart, Dipt. Exot., ii, 2.—Guadeloupe.
Eristalis Gundlachi Loew, Centur., vi, 61.—Cuba.
Eristalis impositus Walker, Trans. Ent. Soc. N. Ser., v, 289.—Hayti.
Eristalis lateralis Walker, Linn. Trans., xvii, 347, 42; List, etc., iii, 622.—Brazil, Chili, Guiana, Mexico, Jamaica.
Eristalis mexicanus Macquart, Dipt. Exot., 2^{e} Suppl., 59, 54.—Mexico.
Eristalis pachypoda Bigot, Ann. Soc. Ent. de Fr., 1880, 224.—Mexico.
Eristalis pusio Wiedemann, Auss. Zw. Ins., ii, 192; Röder, Stett. Ent. Zeit., 1885, 341.—Porto Rico.
Eristalis Sackenis Bigot, Ann. Soc. Ent. de Fr., 1880, 224.—Mexico.
Eristalis semicirculus Walker, Dipt. Saund., 249.—Honduras.
Eristalis Soulouquensis Bigot, Ann. Soc. Ent. de Fr., 1880, 228.—Hayti.
Eristalis testaceicornis Macquart, Dipt. Exot., 4^{e} Suppl., 138, 62.—Mexico.
Eristalis tricolor Jænnicke, Neue Exot. Dipt., 92.—Mexico.
Eristalis unicolor v. d. Wulp, Tijdschr. v. Entom., xxv, 131.—Guadeloupe.
Eristalis basilaris Macquart, Hist. Nat. Dipt., i, 502, 4.—North America.
Eristalis inflatus Macquart, l. c., 507, 18.—North America.

"I did not find the types of these species either in Lille or in Paris, and the descriptions do not apply to any of the known species." (O. Sacken, Cat. Dipt., 133.)

Eristalis everes Walker, Dipt., Saunders., 246.—North America.

Osten Sacken could not find the type of this species in the British Museum; the description will not permit identification.

DOLIOSYRPHUS.*

Doliosyrphus Bigot, Bullet. Soc. Ent. de France, No. 13, 1882.
? *Priomerus* Macquart, Hist. Nat. Dipt., i, 511, 1834.

Allied to *Eristalis*, but differs chiefly in the structure of the head and abdomen. Large, black and yellow, thinly pilose species. Head large, globose. Eyes pilose. Frontal triangle of the male large, projecting, in profile forming an obtuse angle near the middle. Antennæ small, arista bare. Abdomen broadest at base of second segment; narrowed to the tip of the fourth segment, concave on the sides, the tip of fourth segment less than a half of the width of the second segment. Hind femora much swollen and elongate, hind tibiæ compressed and arcuate. Otherwise as in *Eristalis*. Type of genus *D. scutellatus* Bigot.

This description is drawn from males of *D. Rileyi*. I have seen three other species from Mexico, all agreeing essentially in these characters, and I believe the genus is a well-founded one.

Doliosyrphus Rileyi, n. sp. (Plate VIII, fig. 8.)

Habitat.—New Mexico!

♂. Length, 14 to 15^{mm}. Eyes pilose. Antennæ blackish brown; arista thin, bare. Face concealed beneath dense gray pollen, on the sides

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* Δόλιος, deceitful; *σύρφος*, a small winged insect.

more ochraceous, an elongate median spot, and the cheeks in front, shining black; in profile gently concave below the antennæ, the tubercle nose-like. Frontal triangle very projecting in profile, obtusely angulated in the middle; shining black, with black pile; the white dust of the face extends up narrowly along the eyes. Dorsum of thorax opaque black, the anterior border and a narrow transverse band on the suture grayish-yellowish pollinose, in front of the scutellum a broad subquadrate area shining, deep metallic blue. Pleuræ thickly grayish pollinose below; on the mesopleuræ with yellow pile, which extends up to the end of the transverse band. Scutellum light opaque yellow with short sparse black pile; at the base rather narrowly opaque black. Abdomen brownish black, opaque, with two pairs of large quadrilateral yellow spots; the black of the second segment is a little broader in front, and extends outward behind rather narrowly and acutely to the lateral margin; spots on the third segment subquadrate, touching the anterior margin, and separated by about their own width; fourth segment with a bluish, metallic, subinterrupted, shining cross-band; second, third, and fourth segments with a narrow yellow hind margin. Hypopygium wholly shining black. Legs black, tibiæ and tarsi reddish brown. Wings lightly infuscate on distal half, and with an obscure brownish spot.

Four specimens, New Mexico (Mr. G. F. Gaumer). I take pleasure in dedicating this beautiful species to Prof. C. V. Riley.

ADDITIONAL NORTH AMERICAN SPECIES.

Doliosyrphus hirtipes Bigot, Bull. Soc. Ent. de Fr., 1882; Ann. Soc. Ent. de Fr., 1883, 343. Panama.

Doliosyrphus scutellatus Bigot, Bulletin Soc. Ent. de Fr., 1882; Ann. Soc. Ent. de Fr., 1883, 342. Panama.

PTEROPTILA.*

Plagiocera Macquart (non Klug), Dipt. Exot., ii, 2, 59, 1842.
Pteroptila Loew, Centur., vi, 59, 1865.

Large, robust, nearly bare species, with bright yellow markings of very short pile on thorax and abdomen. Head hemispherical, a little broader than the thorax. Eyes in male contiguous, bare; antennæ small, third joint oval, first two joints short. Face nearly perpendicular, below the antennæ a little receding, not much produced below the eyes, very slightly tuberculate. Thorax somewhat narrowed in front; scutellum broad. Abdomen moderately longer than the thorax, the hypopygium large, unsymmetrical. Legs moderately stout, the hind femora considerably thickened, without spines or protuberances below. Wings dark colored in front, clothed with microscopic pile; the third vein bent deeply into the first posterior cell; marginal cell closed and petiolate; anterior cross-vein beyond the middle of discal cell.

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* Πτερόν, wing, and πτιλόν, plumage.

TABLE OF SPECIES.

1.—Legs black; third abdominal segment with an entire yellow cross-band, the first segment without yellow spots . . . . cincta

The four front legs, at least, not black; third segment with a pair of spots, first segment also with yellow 2

2.—Terminal joints of the tarsi black; the dorsal suture with four distinct spots. decora

Tarsi wholly light colored; spots on suture coalescent into an interrupted band 3

3.—Black species; hind femora in part black; abdomen considerably narrowed posteriorly . . . . crucigera

Abdomen and head yellowish reddish; legs without black; abdomen moderately narrowed posteriorly . . . . ruficrus

Pteroptila crucigera. (Plate VIII, figs. 1, 1*a*, 1*b*, 1*c*.)

? *Milesia acuta* Fabricius, Syst. Antl., 189, 7; Wiedemann, Auss. Zw. Ins., ii, 110, 8 (translation from Fabricius).

Milesia crucigera Wiedemann, Auss. Zw. Ins., ii, 105, 2.

Mallota milesiformis Macquart, Hist. Nat. Dipt., i, 500.

Plagiocera crucigera Macquart, Dipt. Exot., ii, 2, 60, 1; pl. x, fig. 7.

Habitat.—Georgia, Florida, Texas! Yucatan (Macq.).

♂, ♀. Length, 14 to 15^{mm}. Antennæ reddish brown. Face yellowish red, thickly clothed on the sides with whitish pollen and bright yellow pile; a broad median stripe and the cheeks shining black, sometimes reddish. Front in female narrow above, with a broad black stripe, yellow pilose on the sides below the ocelli; frontal triangle with a slender triangular black spot; posterior orbits with abundant short yellow pile. Thorax black, but little shining, in front with two opaque black stripes, not reaching the suture; clothed with very short black pile and with markings of short, thick, bright-yellow pile as follows: an oval spot on each side of the middle in front; a fascia extending along the suture, broadly interrupted in the middle and continued outwardly to a spot on the sternopleuræ; another transverse fascia extends across in front of the scutellum, narrowed on the sides before reaching the spots on the post-alar callosities; the anterior spiracles just below the humeri are light yellow, and the posterior pair on the sides of the mentanotum white. Scutellum yellowish on its border. Abdomen black, somewhat shining; the first segment and anterior part of second opaque; first segment with a pair of oval spots of yellow pile on the hind part; second segment with narrow posterior yellow margin; third segment with a yellow pilose spot on each side in front, and a quite narrow yellow hind margin; fourth segment similar, but the spots smaller, and the hind margin very narrow or obsolete. Hypopygium shining reddish brown, slightly yellowish pollinose. Legs light reddish yellow, the hind femora in large part blackish. Wings on the basal portion in front as far as the cross-veins yellowish; beyond dark brown, filling out the sub-costal, the marginal, submarginal, outer part of first basal, and the anterior part of first posterior cells.

Five specimens.

In specimens illy preserved the yellow pile markings of the abdomen or thorax may be wholly rubbed off, leaving only indistinct whitish spots in their place. The second segment may also show an elongate reddish spot on each side near the middle.

Pteroptila decora.

Pteroptila decora Loew, Centur., vi, 59.

Habitat.—Cuba!

♂, ♀. Length, 9 to 12^{mm}. Black. Head of the same color, posterior orbits thickly fringed with yellow pile, or tomentum. Front yellow pilose; vertex, and median stripe black. Antennæ ferruginous; third joint short ovate, above blackish. Face thickly clothed with white pollen and yellow pile, leaving a median shining black stripe; cheeks broadly shining black, except the posterior part. Dorsum of thorax with nine yellow spots as follows: Two on the front margin, four on the transverse suture, and three sub-coalescent ones on the posterior margin. Scutellum reddish or reddish-black, black at the base. Abdomen with six yellow spots, namely, two subarcuate ones on the first segment, and two larger ones on the anterior angles of the third and fourth segments. Hypopygium brown. Legs luteous, or brownish-luteous; outer part of the hind femora subfuscous or fuscous, the extreme tip, however, always lighter colored; last three or four joints of all the tarsi black. Wings hyaline, brown on the front part; as far as the tip of the auxiliary vein the color is more yellowish, the costal cell especially so.

Two specimens.

Pteroptila ruficrus.

Milesia ruficrus Wiedemann, Auss. Zw. Ins., ii, 105, 3.

Habitat.—Cuba!

♂, ♀. Length, 12 to 13^{mm}. Brownish-yellowish, the dorsum of thorax blackish brown. Vertical triangle of male elongate. Stripe of front and face shining brownish-yellow, the pile on the sides and posterior orbits light yellow; cheeks like the facial stripe. Antennæ yellow, the third joint somewhat brownish. Yellow pilose markings of the thorax as in *P. crucigera*; that is, with two anterior spots, an interrupted sutural cross-band, and three sub-coalescent spots on the hind border. Scutellum yellowish-brown. Abdomen with a pair of coalescent, arcuate, yellow pilose spots on the first segment, a slender, nearly contiguous, pair on the anterior border of the third segment, and a smaller pair on the sides of the fourth; second, third, and fourth segments each with a slender yellow hind margin; in color the abdomen is dark ferruginous or yellowish-red. Legs yellow, or somewhat reddish-yellow, the hind femora, except the basal portion and tip, reddish or brownish-red. Wings light-brown on the anterior part, hyaline behind; on the basal portion the brown is much more dilute or yellowish, the costal cell light yellow.

Two specimens (G. F. Gaumer).

This species chiefly differs from *P. crucigera* in its more yellowish-reddish color throughout (most noticeable in the abdomen, facial stripe, hind femora, etc.), in the yellow pollinose spots of the first abdominal segment being united, and in the female abdomen being less narrowed behind.

Pteroptila cincta.

Musca cincta Drury, Ins., i, 109; pl., xlv, fig. 6.
Syrphus pinguis Fabricius, Syst. Ent., 763, 6; Ent. Syst., iv, 282, 16.
Eristalis pinguis Fabricius, Syst. Antl., 233, 6; Wiedemann, Auss. Zw. Ins., ii, 193, 61.
Milesia Ania Walker, List, etc., iii, 564; Macquart, Dipt. Exot., 5er Suppl., 94, 9.

Habitat.—San Domingo!

♀, ♂. Length, 17 to 19$^{\mathrm{mm}}$. Black. Eyes of male broadly contiguous. Front of female black, shining, narrowly white pollinose on the sides below. Cheeks and a broad facial stripe shining black; the sides of the face densely white pollinose and thinly white pilose. Antennæ black. Posterior orbits white pollinose and pilose. Thorax opaque black, with bright yellow markings of short dense pile, as follows: Two rounded spots on the front margin, one on each side at the outer ends of the transverse suture, coalescing with larger one on the mesopleuræ, one of longer pile on each post-alar callus, connected by a transverse one in front of the scutellum. Tegulæ light yellow, fringed with yellow pile. Scutellum deep brownish-red, black at the base. Abdomen opaque black, sometimes tinged with red; second segment with a pair of large, deeply opaque, red triangles; third segment in front with an entire cross-band of bright yellow pile, very slightly emarginate in the middle behind; fourth segment with a small spot on each side of the same colored pile; in the female a small triangle on the third segment behind, two-thirds of the fourth segment, and the fifth segment wholly, deep shining bluish-green; in the male the larger part of the fourth segment and the very large hypopygium are shining brownish-red. Legs deep black, the pulvilli light yellow; in the male on the posterior sides of the front and middle femora with thick black pile. Wings hyaline, rather narrowly brownish along the front border.

Five specimens (Frazar.)

Pteroptila zonata.

Pteroptila zonata Loew, Centur., vi, 60.

Habitat.—Mexico (Lw.)!

♂. Length, 13.5$^{\mathrm{mm}}$. Black, opaque, sides of the face white pollinose; two spots on the anterior margin of the thorax, the transverse suture, the posterior margin of the thorax, and a basal abdominal fascia, white tomentose; fascia of the second abdominal segment livid; on each of the following segments a basal, yellow tomentose fascia; hypopygium yellow pollinose; wings hyaline, stigma and the marginal and submarginal cells blackish.

Black, opaque. Head of the same color, the lateral margins of the front, and the face, except the median stripe, white pollinose. Antennæ black, third joint ovate. Scutellum livid, near the base black. First segment of the abdomen, except the base, white pollinose; second segment with a livid fascia, narrowly interrupted, toward the sides strongly dilated, but abruptly cut off before reaching the margin, hind margin yellow; the two following segments, each with a narrow basal fascia yellow tomentose, and the posterior margin vitelline yellow. Hypopygium thickly clothed with vitelline pollen. Legs vitelline yellow; front femora wholly, the base of the middle femora, and the hind femora, except the distal third, black; the hind femora black setulose below, elsewhere the legs wholly clothed with light pile. Wings pure hyaline, all the veins fuscous-black, stigmatic cell, the marginal and submarginal cells blackish.—Translation.

ADDITIONAL NORTH AMERICAN SPECIES.

Pteroptila pratorum.

Syrphus pratorum Fabricius, Syst. Ent., 765, 13; Ent. Syst., iv, 286, 31. West Indies.

Eristalis pratorum Fabricius, Syst. Ant., 236, 18; Wiedemann, A. Z., ii, 166.

Pteroptila opulentus Bigot, Ann. Soc. Ent. de Fr., 336 (*Eristalis*). Cuba.

HELOPHILUS.[*]

Elophilus Meigen in Illigers Magazine, ii, 274, 1803.
Asemosyrphus Bigot, Bull. Soc. Ent. de Fr., No. 13, 1882.
Eurhimyia Bigot, Bull. Soc. Ent. de Fr., No. 2, 1883.

Mostly large, nearly bare species, black or blackish brown, with yellow spots or bands, usually readily distinguished by the presence of light pollinose stripes on the dorsum of the thorax; head hemispherical, not flattened. Antennæ short, the third joint oval; arista basal, bare. Face below the antennæ in profile gently or considerably excavated, the lower part sometimes strongly produced, usually with a tubercle; eyes bare, rarely pilose, separated by a rather broad interval in the male. Scutellum usually more or less translucent. Abdomen sometimes rather broadly oval, often more or less narrowed, sometimes cylindrical. Legs rather stout; the hind femora more or less thickened, and the hind tibiæ arcuate; hind coxæ in the male rarely with a spinous tubercle below. Marginal cell of the wings open; the third longitudinal vein deeply bent into the first posterior cell; small cross-vein oblique, beyond the middle of the discal cell.

See Appendix.

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[*] *῞Ηλιος*, the sun, and *φιλος*, a lover.

Helophilus glacialis.

Helophilus glacialis Loew, Stett. Ent. Zeit., 1843, 120.

Habitat.—Labrador (Lw.)!

♀. Length, 12.5 to 13^{mm}. Face deeply concave below the antennæ, below strongly produced, tubercle large, in profile much receding; the lower border forms with the posterior border of the head an obtuse angle; in the middle a broad shining black stripe, gray dusted above, but reaching to the base of the antennæ; elsewhere as on the greater part of the front covered with whitish-yellow, sometimes more grayish-yellow, pollen; cheeks shining black. Antennæ black; immediately above their base a shining black spot; vertex blackish, the middle line of the front sometimes dark; pile of the front black, on the vertex in moderate extent yellowish. Thorax opaque black, the usual light stripes grayish-white, the front half of the lateral ones and the posterior part of the middle ones indistinct; pile of the dorsum wholly yellow. Scutellum yellowish-brownish, shining; wholly yellowish pilose. Abdomen black, wholly shining on the dorsum; on the second segment on each side there is a large yellow—usually three-cornered—spot, of which the point that is directed inward is usually somewhat whitish colored, and is narrowly separated from the opposite one; on the third segment on each side a narrow whitish arcuate band, which starts from a small yellow spot on the anterior angle of the segment; on the fourth segment the same whitish semi-fascia, but no indication of the yellow spot; on the last segment the bands also present, but somewhat shorter and less distinct; the pile on each segment in front is whitish, behind the bands, blackish; on the lateral margins of each segment the whitish-yellow pile reaches farther back, so that on the posterior angles only a trace of the blackish pile remains. Venter shining black, beset with sparse, obscure whitish pile. Femora black, the hind pair of moderate breadth, the tip of all yellow; tibiæ black, basal third of the hind pair, and rather more than a third of the front and middle pairs yellow, the hind pair moderately bent, and not thickened at the end, the tarsi throughout black. Wings hyaline, somewhat grayish-brownish; stigma light brown, scarcely darker at the base; the longitudinal vein behind the anal cell is somewhat strongly arcuate near its end, the last section of the same vein strongly bent.

Is intermediate in position between *H. groenlandicus* and *H. borealis*. From the former is distinguished (1) by the much more retreating face, (2) by the lack of black pile on the posterior end of the black thoracic stripes and the fore part of the scutellum, (3) by the indistinctness of the light-colored thoracic stripes, and the somewhat more distant position of the two middle ones, (4) by the shining color of the abdomen, which in *groenlandicus* is confined to the posterior part of the segments, (5) by the greater slenderness of the abdominal bands, (6) by the somewhat less width of the hind femora, and the yellow tips.—Loew, l. c.

Helophilus groenlandicus.

Tabanus groenlandicus O. Fabricius, Fauna Groenland., 208, 170.

Helophilus arcticus Zetterstedt, Ins. Lapp., 595, 2; Dipt. Scand, 678, 2; Stæger, Kroyer's Tidsskrif. N. R., i, 359, 24; Loew, Stett. Ent. Zeit., vi, 119, 1843.

Habitat.—Greenland, Lapland (Lw.)!

♂, ♀. Length, 11 to 12^{mm}. Face below the antennæ lightly excavated, below only a little produced, the tubercle slight, in profile nearly perpendicular; the lower line of the head forms with the occiput but little more than a right angle; in the middle of the face with a shining black stripe, which in well-preserved examples does not reach quite to the antennæ; elsewhere on the face, as also on the greater portion of the front, covered with whitish-yellow, sometimes somewhat darker, pollen; cheeks shining black. Antennæ black, immediately above their base with a shining black spot; a median stripe of the front and the region of the vertex dark, nearly blackish; pile of the front black, at the vertex yellowish. Thorax opaque black, the usual light-colored stripes nearly whitish, the lateral ones only distinct at the humeri, behind indistinct; the median ones very narrow, linear, very distinct, in all the specimens broken off before reaching the scutellum; the pile of the thorax is yellow, blackish only on the posterior part of the dark stripes. Scutellum brownish, shining, in front with black, behind with yellow, pile. Abdomen black, opaque, only a little shining on the hind margins of the segments, successively a little broader towards the hind part; on the second segment with a large, yellow, nearly a three-cornered spot on each side, the inner angles of which are usually whitish and approach each other moderately near; on the third segment there is on each side a narrow, yellowish-whitish curved semi-fascia which terminates in a small yellow spot in the anterior angle of the segment, which often in the male has a greater extent; on the fourth segment are seen the same yellowish-whitish semi-fasciæ but no trace of the yellow spots; on the last segments the spots are smaller and less fasciate. The pile in front of the hind margin of the fasciæ is yellowish, from thence to the hind margin of each segment blackish; on the lateral margins the yellow pile extends somewhat farther back, the hind angles, however, always more or less black pilose. Femora black, hind pair moderately dilated; front pair at the extreme tip brownish-yellow, on the hind pair there is a trace of the same color on the under side of the tip; tibiæ black, with the base brownish-yellow; hind pair moderately bent and not thickened at the extremity; tarsi black throughout. Wings hyaline with a grayish-brownish tinge; stigma light brown, darker at its beginning; distal portion of sixth vein moderately strongly arcuate, its terminal portion strongly bent.

Helophilus borealis.

Helophilus borealis Stæger, Kroyer's, Tidskrift, N. R., i, 359, 25. Loew, Stett. Ent. Zeit., vi, 1843, p. 123.

Habitat.—Greenland (Lw.)!

♀. Length, 12 to 13^{mm}. **Face strongly excavated in profile below the** antennæ, below strongly produced forwards, the tubercle very large; in the middle with a broad, shining black stripe, reaching to the base of the antennæ and on the lower half only slightly grayish dusted; elsewhere, as on the greater part of the front, clothed with whitish-yellow dust; cheeks shining black; the lower border of the cheeks forms with the plane of the occiput an obtuse angle. Antennæ black; immediately above their base a shining black spot; the vicinity of the ocelli black; the middle line of the front also somewhat darker; pile of the front black; at the vertex in moderate extent yellowish. Thorax opaque black, the usual stripes grayish, very narrow and indistinct, in the middle interrupted, the median ones obsolete behind. The pile of the thorax is yellowish throughout, without any intermixture of black. Scutellum brownish, shining, on the middle with blackish, on the border with yellow pile. Abdomen black, opaque, the hind margins of the segments, successively wider posteriorly, moderately shining; second segment on each side with a large, yellow, three-cornered spot, the inner angles of which show only a trace of whitish color, and do not approach each other very closely; third segment on each side with a curved, narrow, semi-fascia, not quite reaching the lateral margin, at which there is no trace of a yellow spot; fourth segment with similar whitish semi-fasciæ, which attain the lateral margins; on the last segment they are shorter and less distinct. The pile of the abdomen is thick, erect, noticeably longer than in the related species, of a yellow color, on the hind margin of the second segment somewhat darker, on the hind borders of the following segments in moderate extent blackish; on the lateral margins of the abdomen the pile is throughout yellowish, only on the posterior angle of the posterior segments is there any blackish pile. Femora black, the hind pair of moderate width; in all the tip is brownish-yellow, in the hind pair, however, only at the extreme tip; tibiæ black, base brownish-yellow, the hind pair but little arcuate, at their end slightly yet distinctly thickened; tarsi black throughout. Wings hyaline, somewhat grayish-brownish tinged; stigma dark brown, sharply bordered at each end.

H. borealis is distinguished from *H. grœnlandicus* by the more oblique profile of the face, by the greater length of the pile on the thorax, scutellum and abdomen, by the absence of black pile on the hind part of the black dorsal stripes, by the greater indistinctness and more remote position of the median light-colored stripes, by the less dilatation of the hind femora, which in the females on the distal half on the outer side has a distinct longitudinal groove, while in *H. grœnlandicus* there is only a large flat impression.—Loew, l. c., translation.

Helophilus mexicanus. (Plate VIII, fig. 7.)

Helophilus mexicanus Macquart, Dipt. Exot., ii, 2, 64, 6; tab. ii, fig 2; Osten Sacken, Cat. Dipt., p. 267.

Helophilus polygrammus Loew, Centur., x, 55; Osten Sacken, West. Dipt., 338

Asemosyrphus oculiferus Bigot, Annales Soc. Ent. Fr., 1883, p. 350. (Male.)

? *Asemosyrphus nigroscutatus* Bigot, ibid., p. 351.

Habitat.—Washington Territory, California!, Mexico (Macq., O. S.).

♂, ♀. Length, 11 to 12^{mm}. Face with a short deep convexity below the antennæ to tip of tubercle, thence receding in a nearly straight line to the oral margin; median stripe and cheeks bare, black and shining; the sides of the face concealed beneath dense whitish-yellowish pollen and pile. Antennæ black, the arista reddish-yellow. Front in both sexes very broad, in the male narrowed a little before the ocelli, in the female broader, only a little narrowed toward the vertex; the ocelli in both sexes are remote from each other; the color is shining black above and in the middle below near the antennæ, yellowish pollinose on the sides and across broadly below the ocelli; the pile is yellowish, except across below the ocelli, and at the vertex, where it is black. Dorsum of thorax grayish-olivaceous-black, but little shining, leaving in the middle part six slender opaque black lines, that inclose three slender whitish, stripes, all of which are obsolete before the scutellum; the outer black lines are a little dilated before, and interrupted at the suture; in addition, on each side behind there is a slender opaque black stripe, which runs from the scutellum towards the outer end of the suture. Pile of thorax yellowish, rather abundant; more whitish on the pleuræ. Scutellum obscurely reddish on the outer part. Abdomen broad, not extending beyond the wings; in the female black, the first segment shining, with an opaque spot on each side; second segment on each side with a broad, nearly opaque spot, extending across the front margin, bordered behind on the sides by a light reddish-yellow spot that reaches from the anterior angle to the middle of the segment, extending as a narrow whitish pollinose cross-band inwards and separated from that of the other side by a not very broad opaque black interval; posterior part of the second segment shining, the narrow hind margin gray, as on the following segments; third segment with two slender, gray pollinose spots, beginning at the front angles and curving backwards, inwards, and then a little forwards, broader at the inner ends, and separated from each other by a narrow, partially opaque, interval; in front of these spots the black is sub-opaque, elsewhere shining; fourth segment similar, but the spots more slender and nearly touching the front margin on their inner ends, thus leaving on each side in front a small, opaque, semi-lunar spot. In the male the abdomen is in large part dark-reddish; on the third segment the color is almost wholly red, brownish behind, the gray spots nearly obsolete, leaving only the beginnings and tips; the fourth segment like that in the female, but the opaque parts are more brown, and the shining part red. Hypopygium wholly reddish. Legs black; the base and tip of four front tibiæ narrowly red, the hind tibiæ variegated black and red; all the tarsi more brown; metatarsi of the hind feet distinctly swollen. Wings nearly hyaline.

Six male and seven female specimens, California (O. T. Baron), Washington Territory (H. K. Morrison).

Helophilus latifrons.

Helophilus latifrons Loew, Centur., iv, 73; Osten Sacken, West. Dipt., 337.

Habitat.—Massachusetts, Connecticut, Western Kansas, Wyoming, Washington Territory, Montana, Oregon, California!, Red River of the North (O. S.)

♂, ♀. Length, 13 to 15^{mm}. Face yellow, thickly covered with light yellow pollen and pile, leaving in the middle a moderately broad, shining, reddish-yellow stripe, which ends acutely a little below the antennæ; the lower end at the oral margin black. Cheek black, shining, pollinose behind. In profile the face is moderately concave above, from the tubercle to the oral margin nearly perpendicular and straight; the lower border of the cheeks forms with the plane of the occiput but little more than a right angle. The front in the male is broad above, in width fully equal to half the distance between the foremost ocellus and the base of the antennæ; across the ocelli black, a little shining, with black pile; below the front ocellus the black color is concealed beneath dense yellow pollen, and wholly yellow pile, a small triangle above the base of the antennæ shining, reddish or brownish yellow. Scutellum wholly translucent yellow, on the outer part sparsely and shortly black pilose, but chiefly yellow pilose. First abdominal segment grayish pollinose, with a black spot near the outer part, and the sides yellow. In the male the remaining segments as follows: Second segment with a broad light-yellow cross-band, interrupted in the middle, leaving a broad flattened triangle in front, opaque black, connected by a median stripe with a narrow posterior shining black cross-band; third segment with a similar yellow band, more narrowly interrupted, touching the front margin, rounded on the inner angles behind, and leaving a broader posterior shining black band; the opaque black is confined to a semicircular or semioval spot in the middle in front, separated from a smaller one behind by two intervening, oblique, yellowish pollinose, transverse, nearly contiguous spots; fourth segment narrowly yellow on the sides, across the middle a grayish-yellowish pollinose cross-band, convex in the middle in front, broadly emarginate behind; the black shining; the posterior margin yellowish; hypopygium black, concealed beneath dense yellowish pollen. In the female the shining black cross-bands on the posterior part of the second and third segments is broader; the yellow cross-band of the third segment is narrower and more broadly separated, connected in the middle or nearly so by yellowish pollen; the black spot in front is usually not oval, but forming a more or less elongate band, attenuated on the sides, but not reaching the lateral margins; the next segment similar to that in the male, but the yellow pollinose band narrower and more gently bi-concave; fifth segment shining black, with a yellowish pollinose cross-band; the yellow on the sides of the fourth segment in both sexes may encroach on the ground of the cross-bands, and also similarly in the fifth segment in the female. Legs yellow; base of front and middle femora, distal end of the front tibiæ and the whole of the front tarsi, the tip of middle tarsi and the whole of the hind legs, except the distal end of the femora and the base of tibiæ, black; the extreme tip of hind femora also black. Wings hyaline; stigma yellowish. Dorsum of thorax densely light yellow or ochraceous opaque, with three sub-opaque black stripes, of nearly equal width throughout, the middle one a little broader; pile yellow; pleuræ densely gray pollinose.

Twenty male and as many female specimens, collected chiefly from New England, where it is the most common species. In addition, fifteen specimens from the Rocky Mountain and Pacific regions, and twenty-four from Montana (Professor Comstock), do not differ from the eastern ones. Both this and the following are closely allied to *H. trivitattus*, *hybridus*, and *pendulus* from Europe.

Helophilus similis. (Plate VIII, fig. 2.)
Helophilus similis Macquart (non Curtis), Dipt. Exot., ii, 2, 64, 7. 1842.
Helophilus fasciatus Walker, List., etc., iii, 605.
Eristalis decisus Walker, List, etc., iii, 614.
Helophilus susurrans Jaennicke, Neue Exot. Dipt., 94.

Habitat.—New England, Canada, Indiana, Kansas, California!

♂, ♀. Length, 13 to 15^{mm}. Very closely allied to *H. latifrons*, with which it may be readily confounded. It will, however, be at once distinguished by the front of the male being much narrower above, not more than a third or fourth as wide as the distance from the ocelli to the base of the antennæ, and in the female by the front being wholly black pilose; in the male the front is black pilose on the upper half; the antennæ are lighter colored, red, or yellowish red, except on the upper part of the third joint, where it is blackish; the yellow cross-bands of the second and third abdominal segments are not as broad, and the posterior black portion is broader; the hind tibiæ are usually red, or brownish red, with the basal third yellow; the pile of the scutellum is in larger part, sometimes almost wholly, blackish. Otherwise the species scarcely differs from *latifrons*.

Ten specimens from Connecticut, Massachusetts, Indiana, Kansas, Canada, and a single male from California. At the time Macquart named the species there existed another *H. similis* Curtis (Brit. Ent. 429, 5), now considered a synonym of *H. pendulus*, and hence need not interfere with the present.

Helophilus laetus. (Plate VIII, fig. 6.)
Helophilus laetus Loew, Centur., iv, 77.

Habitat.—Connecticut, New York!, Wisconsin, Illinois (O. S.).

♀. Length, 8.5 to 9^{mm}. Face concave below the antennæ and then gently convex to the oral margin, wholly yellow, grayish-yellowish pollinose, on the lower part, in the middle, a narrow shining spot; cheeks black but not extending forward. Front black, thickly yellowish pollinose and wholly black pilose, except on the vertex. Antennæ yellowish red; arista black at the tip. Dorsum of thorax opaque black, with four grayish-yellowish stripes; the middle pair not very broad, gradually dilated on the hind part, the median black stripe has in the middle a very slender grayish pollinose stripe, obsolete in front and behind. Scutellum yellow, narrowly black at the base and on the sides. Abdomen: First segment pollinose, except a black spot on each side; second segment with a broad, widely interrupted, yellowish-red cross-band, the posterior margin narrowly shining, in the middle with a yellowish spot; third segment similar, the cross-band very narrowly interrupted, with a moderately broad, biarcuate, opaque black cross-band behind the yellow, posterior margin of the segment narrowly yellow, broadly and angularly dilated in the middle and yellowish pollinose; on the fourth segment the yellow band is less wide, entire, touching the front margin on the whole length, narrowed in the middle, behind it an entire black cross-band, the sides of which are oblique; posterior margin more broadly yellow, behind the black an entire pollinose cross-band, narrow at the sides, broad in the middle; fifth segment wholly pollinose, the margins yellow. Legs reddish-yellow; base of front and middle femora, an incomplete median ring on the hind femora, tip of front tibiæ on the inner side, end of hind tibiæ and an incomplete subbasal ring, and the hind tarsi, black or blackish. Wings nearly hyaline.

♂. Face and lower part of front brighter yellow; front above, between the parallel orbits, black, lightly pollinose, with black pile, below on the yellow part the pile is yellow. Stripes of grayish pollen on the dorsum of the thorax narrowed, almost linear, the slender line in the middle of the median black stripe almost indistinguishable. Pile of thorax moderately long, yellow, across the disk of the scutellum somewhat intermixed with black. Abdomen: first and second segments as in the female, except that the yellow cross-band is broader and a little less widely interrupted; third segment with two large yellow spots, narrowly separated at the tips, leaving a slender, biarcuate cross-band of opaque black behind, narrower than in the female, connecting at their inner ends with the triangular or semi-oval spot in front, which is less transverse than in the female; the fourth segment wholly grayish pollinose, except a very slender, biarcuate black cross-band, connecting in the middle with a small spot in front, hind margin yellow; hypopygium black, wholly pollinose. Front and middle femora more broadly black at their base; hind femora black, except narrowly at the base, and a broad, preapical ring.

A single male specimen from Saratoga, N. Y., August 30, on meadow land, and a female from New Haven, which undoubtedly belongs to the same species, although the black of the femora is different in extent, and which in the male does not agree so well with Loew's description.

Helophilus chrysostomus. (Plate VIII, fig. 5.)

Eristalis chrysostomus Wiedemann, Auss. Zw. Ins., ii, 174, 30.
Helophilus chrysostomus Osten Sacken, Cat. Dipt., 133.

Habitat.—New England, New York!, Georgia (Wied).

♂, ♀. Length, 9.5 to 11mm. Front of male not broad, the sides parallel on upper half; on the lower half, like the face, of a fine light golden-yellow, with yellow dust and pile, not at all shining; on the upper half, in front of the ocelli, thickly covered with a brownish-yellow dust, the ocelli and vertex black, shining, and narrowly black pilose. In the female the front is broader, and wholly clothed with black pile, more abundant across the middle; the ground color is shining black, obscured by the pollen, which is less abundant and less yellow than in the male. Antennæ yellowish red; arista red at base. Face gently concave below the antennæ, then gently convex to the tip, the lower part considerably produced downwards and forwards; below shining black on the sides, back below the eyes on the cheeks obscured by pollen. In the female the yellow color of the face is concealed beneath more whitish pile, so that it does not have the bright color of the male. Dorsum of thorax light yellowish-olivaceous, with three broad, black, opaque, velvety stripes, rather narrowly separated, but more broadly so in the male than in the female; the outer stripes do not reach quite to the front and back margins; pleuræ pollinose. Scutellum shining black, the border red, pile yellowish. Abdomen in the male slender, narrowed at hind part of the second segment, yellowish and ferruginous-red; first segment grayish pollinose, except a small spot near the outer sides behind, continuous with the anterior angles of the black on the next segment; second segment broadly velvety black, extending nearly the whole width of the segment in front, thence narrowed so that at the middle of the segment it does not occupy more than one-third the width; then again expanding, usually of a less deep color (sometimes only brown or ferruginous); the broad hind margin of the segment shining red, the long lateral triangles are yellowish, along the black in front often white pollinose; third segment sometimes wholly and uniformly red, but more usually with a brownish or blackish spot in front in the middle, and a diffuse, indistinct, brownish cross-band before the broad shining hind margin, the sides in front, and two spots near the middle, of white pollen, are often present; fourth segment with a pair of small slender spots in the middle in front, and the anterior angles whitish pollinose, the extreme hind border of the fourth and fifth segments yellow. In the female the abdomen is broader, wholly black, with grayish-white cross-bands; first segment wholly dusted; second segment with a broad shining cross-band behind, elsewhere velvety black, except the oblique, pollinose, yellow side-spots; these spots reach along the sides to the front angle of the segment, obliquely concave in front; third and fourth segments similar, but the spots are very narrowly separated, beginning at the anterior angles, concave in front, convex behind, the shining part of the fourth segment is somewhat dusted; fifth segment wholly pollinose, except a narrow black cross-band in front. Basal half of the front and middle femora, hind femora, except the base and a preapical ring, the distal part of hind tibiæ and the last four joints of hind tarsi black, the base of hind tibiæ and their metatarsi more brown; elsewhere the legs are reddish yellow, lighter on the front and middle pairs. Hind coxæ of the male with a long stout obtuse process below, the hind femora below near the base with a slight protuberance, hind tibiæ with a sharp spur at the tip; all wanting in the female. Wings lightly tinged with brownish.

This description is based on twelve males and nearly as many females that I caught about the blossoms of *Cornus paniculata* in the latter part of June, in Connecticut. From the color of the legs and feet and head I do not doubt but that it is Wiedemann's species; he must have been, however, mistaken in the sex of his specimen; he does not mention the process on the hind coxæ. In the female there is but a slight indication of this process, but his description of "rost gelb" will not apply.

Helophilus distinctus, n. sp.

Habitat.—Connecticut, Virginia, Pennsylvania!

♂, ♀. Length, 7.5 to 10^{mm}. Very closely allied to *H. chrysostomus* Wied., but easily distinguished in the male by the absence of the mammiform process on the hind coxæ below, and in the female by the black dorsal thoracic stripes being considerably narrower than the intervening gray ones; the middle black stripe may be dilated in front by a grayish line. The face in the male is less yellow, in the female the ground color is almost wholly black. The antennæ are darker in color, the first two joints blackish. The black stripes on the dorsum of the thorax are narrower; in the female very narrow; in the female the pollinose spots on the third and fourth segments of the abdomen are a little broader and a little more widely separated. In the male on the hind coxæ below there is a small obtuse projection, similar to that of the female of *H. chrysostomus;* in the female they are rounded below; the spur on the end of the hind tibiæ is less acute. The species is, moreover, smaller in size.

Four specimens, two of each sex, from Connecticut. The species I found common on a meadow near New Haven, but, unfortunately, not recognizing it as distinct from *H. chrysostomus*, I neglected to collect a greater number of specimens. The color of the face not being "vergoldet" and the antennæ darker, not "rost gelb," I do not think that this can be Wiedemann's species.

Helophilus modestus, n. sp. (Plate VIII, fig. 4.)

Habitat.—Wyoming!

♂, ♀. Length, 6 to 8^{mm}. Front in both sexes broad, narrowed but little in the male, the ocelli not remote from each other; black, with a broad band of yellowish pollen across the middle, pile chiefly blackish. Antennæ black, the arista of the same color. Face deeply concave below the antennæ, a little below the middle with a large protuberant tubercle, between which and the mouth receding and gently concave;

shining black on the tubercle and below along the mouth, on the sides above with yellowish dust and pile. Cheeks below the eyes moderately broad, whitish dusted. Dorsum of thorax nearly bare, opaque black, shining on the sides, in the middle with a slender, on each side with a broader grayish-olivaceous stripe, a little broader than the intervening black space, all confluent in front of the scutellum. Pleuræ grayish pollinose. Scutellum yellowish-red on the margin and with yellowish pile. Abdomen oval, shorter than the wings, wholly black, except a narrow yellow hind border on the last segments; shining; in the female on the sides of the first segment, second segment along the base and extending back narrowly in the middle to nearly the hind border, opaque black, narrowed on the sides as though by an interrupted cross-band; in the male the first segment, except the sides, the second segment, except the lateral and posterior margins (on the sides in the middle and behind more broadly), and the third segment with a large triangle in front, its apex near the hind margin, and nearly truncated by a slender interrupted cross-band, opaque black. Legs black; the distal end of all the femora (the hind femora at the tip above, however, black), and narrow base of all the tibiæ and a rather broad ring near middle of hind tibiæ, yellow; sometimes rings near the middle of front and middle tibiæ less distinctly yellow. Wings faintly tinged with blackish.

Three male and one female specimens from Como, Wyoming (alt. 7,000 feet), June 20.

Helophilus conostomus, n. sp. (Plate VIII, fig. 3.)
? *Helophilus stipatus* Walker, List, etc., iii, 602.
? *Helophilus Anausis* Walker, List, etc., iii, 603.
Helophilus lineatus Osten Sacken (non Fabr.), Cat. Dipt., 134.

Habitat.—Connecticut!, Massachusetts, Illinois, Canada (O. S.).

♂, ♀. Length, 8 to 9^{mm}. Front yellowish-brown, above the antennæ more yellow; pile black, more yellowish above and below. First two joints of the antennæ blackish-brown, third joint reddish-brown or red. Face light yellow, with similar colored pollen, concave for a short distance below the antennæ, and then nearly straight to the tip, the lower part of the face much produced downward and forward into a slender nearly regular cone, pointed at the tip. Cheeks black, extending more narrowly along the oral margin to the tip. Dorsum of thorax opaque black, with a broader, lateral, grayish pollinose stripe and two narrow dorsal ones, linear in the male; a little broader in the female, and expanded in front of the scutellum so as to touch each other at the tips. Pleuræ thickly dusted like the dorsal stripes. Scutellum brownish-yellow or yellowish, translucent, usually more or less black along the base; pile, like that of the thorax, grayish-yellow. Abdomen black, with yellow and grayish pollinose markings. In the male the first segment opaque, except the lateral margins; second segment with a large yellow spot on the sides, extending from the anterior angles nearly to the posterior part, inclosing the opaque in the shape of a goblet, of which the stem is short, square, and rectangular, the base forming a narrow complete cross-band; the inner ends of the yellow spots are a little whitish-dusted; third segment with two large yellowish-red, subtriangular spots, the posterior margin straight, more or less indistinct, their inner end whitish pollinose, separated by about the same width as the preceding, the inner anterior sides a little convex, the front ends slightly encroaching on the second segment, the narrow hind margin yellow, dusted with whitish pollen, which expands somewhat in the middle; elsewhere the black is opaque; fourth segment on the front half shining, on each side with a moderately broad, arcuated, pollinose spot, the outer end attaining the anterior angle, posterior border yellow, and before it with a cross-band of about the same width, subopaque black; the yellow is pollinose, encroaching somewhat on the black in the middle. In the female the color of the abdomen is less opaque, with pollinose markings as follows: First segment, except an oval spot on the sides; second segment with a slender convex spot on each side near the middle, the inner end widened, expanded on the sides in a slender triangle, the ground color of which is reddish yellow, posterior border in the middle also pollinose; third and fourth segments similar, the spots not so slender, the lateral reddish yellow spots smaller, and the posterior pollinose margin broadly dilated in the middle, so that in the fourth segment it is more than a third of the width of the segment; fifth segment wholly pollinose, except narrowly at the base. Legs reddish-yellow; a spot above on the front and middle femora, the tip of front tibiæ, and the distal joints of their tarsi, a large oval spot on the upper part of the hind femora, and the extreme tip black; a sub-basal and a preapical ring on the hind tibiæ, and the hind tarsi brown. Wings nearly hyaline.

Although I have but two specimens (♂, ♀), from Connecticut, yet from comparison with European specimens and also with the full description of *H. lineatus* given by Loew (Stett. Ent. Zeit., vii), I am satisfied that this is not the same. The male differs in the much larger extent of yellow on the abdomen, and the thoracic stripes being more distinct; in the female by the greater extent of pollen on the abdomen, and especially by the thoracic stripes, which are broad and distinct, a third of the width of the intervening black stripe; they are not diffuse on the posterior part, but are well defined quite to the scutellum; the intervening black stripe is narrowed in a lanceolate form at the tip, merely touching the scutellum in an acute point. In *H. lineatus*, on the posterior third, the stripes are widened in a more grayish color so as to leave only a slender line between them, apparent in well-preserved examples. The lower part of the face is less brownish in *H. conostomus*, and the legs have a less extent of black. I am not sure that all these differences, especially the latter ones, are constant.

Should the genus *Eurhimyia* Bigot be deemed admissible (I do not think that it is) this species would belong in it.

A single specimen without a head, of this species is in the Loew type collection, bearing the label "Spec. indescr."

Helophilus hamatus.

Helophilus hamatus Loew, Centur., iv, 79.

Habitat.—Hudson's Bay Territory (Lw.)!

♀. Length, 8.5mm. Face strongly produced, subconic, cheeks black, no median stripe. Antennæ subochraceous. Front blackish, thinly clothed with ochraceous pollen near the antennæ, short black pilose. Dorsum of the thorax with four rather broad, ochraceous pollinose stripes, the intermediate ones cinerescent. Scutellum reddish. Abdomen with nearly parallel sides; first segment whitish-cinereous; the three following segments black, opaque, each with two whitish lunulate spots, the posterior margin shining; last segment cinereous pollinose. Legs luteous-brownish; femora with black markings, hind tibiæ with two fuscous rings, the front and hind tarsi wholly and the tip of the middle tarsi fuscous-black. Wings cinereous hyaline, stigmatic spot subfuscous.

Translation from the original, compared with the type specimen at Cambridge.

Helophilus divisus.

Helophilus divisus Loew, Centur., iv, 78.

Habitat.—District of Columbia (Lw.)!

♀. Length, 9mm. Face less projecting than in *H. obsoletus*, *integer*, and *lætus*, the antennal arista black, the abdominal lunules narrow, the cinereous wings and the markings of the legs are all different. Pile of the front black, above rather long, at the vertex luteous. Dorsum of the thorax with very short luteous pile, that of the scutellum longer. Four broad stripes and a narrow median stripe, attenuated at each end, luteous pollinose. Basal margin of the scutellum black. Luteous fasciæ of the abdomen very narrow, broadly interrupted, so that each is divided into two moderately curved lunules; posterior margins of the second, third, and fourth segments obsoletely lutescent, fasciate with subcinereous pollen. Pile of the abdomen nearly wholly black. Legs luteous; the hind ones more obscure, the femora, except the base and tip, fuscous, at the base with a small black spot; basal half of the four front femora black; tip of front tibiæ and last two joints of the four front tarsi blackish; hind tibiæ near the base with a subfuscous ring, and the apical third black, hind tarsi black. Wings cinereous.

Translation from the original, compared with the type specimen at Cambridge.

Helophilus integer.

Helophilus integer Loew, Centur., iv, 76.

Habitat.—New York (Lw.)!

♀. Length, 9 to 10mm. Very similar to *H. obsoletus*, but the pile of the whole body much shorter, and the four dorsal luteous pollinose stripes rather broad and very distinct. Scutellum at the base black. Luteous fasciæ of the abdomen broad, the first narrowly interrupted, the remainder entire; each segment, except the first, with a median subtriangular spot ochraceous pollinose and contiguous with the hind margin; hind margin of the third segment narrow, of the fourth segment broad, luteous. Legs luteous; front femora near the base with a black spot; hind femora near the base with a minute blackish spot, above in large part black and near the tip on each side with a fuscous spot; hind tibiæ near the base with a fuscous ring, at the tip blackish fuscous; hind tarsi wholly blackish fuscous.

Translation of the original, compared with the type specimen at Cambridge.

Helophilus obscurus.

Helophilus obscurus Loew, Centur., iv, 74.

Habitat.—Colorado (O. S.)!

♀. Length, 10mm. Black and yellow varied. Face somewhat projecting, with the cheeks and a rather broad median stripe black. First two joints of the antennæ brownish-black, third joint red, more obscure on the upper portion. Dorsum of thorax with four yellow stripes, the intermediate ones slender. Scutellum yellowish testaceous. Abdomen black, opaque, the posterior margins of the segments moderately shining; with four yellow, interrupted cross-bands, the anterior ones of moderate width, the posterior ones narrow. Femora black, the tip of the front and middle pairs and a subapical ring on the hind pair luteous; front tibiæ and tarsi wanting; middle tibiæ and metatarsi luteous, remaining joints of the tarsi black; hind tibiæ black, base luteous, and a median ring brown, tarsi wholly black. Wings cinereous hyaline, near the costa very dilutely brownish, stigma subfuscous.

Translation from the original, compared with the type specimen at Cambridge. A second specimen has the front and middle femora black, except the tip, and their tibiæ and tarsi yellow, except that the front tibiæ are brownish in the middle.

Helophilus obsoletus.

Helophilus obsoletus Loew, Centur., iv, 75.

Habitat.—Hudson's Bay Territory (Lw.)!

♀. Length, 9mm. Two slender stripes of the dorsum of the thorax luteous pollinose, obsolete. Basal margin of the scutellum black. Luteous fasciæ of the abdomen of moderate width, the first broadly, the second narrowly interrupted, the third entire; each segment, except the first, with a posterior luteous margin, and a triangular spot contiguous with it of the same color. Legs luteous, the color of the hind pair darker; front femora near the base with two minute black spots, hind femora on the posterior side with a large black spot; hind tibiæ near the base with a brownish ring, and at the tip blackish; hind tarsi wholly black. Pile of the whole body a little longer than in the female of *H. integer* or *laetus*.

Translation from the original, compared with the type specimen at Cambridge.

Helophilus porcus.

Eumerus porcus Walker, List, etc., iii, 551.

Habitat.—Hudson's Bay Territory (Walker).

"♀. Length of the body 3–4 lines; of the wings [spread] 6–7 lines. Niger, thorace cinereo quadrivittato, abdomine maculis nigris nitentibus canisque ornato, antennis piceis, pedibus nigris, genubus tarsisque ferrugineis, alis subcinereis.

"Body black, clothed with black hairs; head covered with white bloom, and clothed with white hairs beneath, pale yellow in front and around the base of the feelers; mouth black; feelers pitchy; bristle black; eyes brassy black; all the facets small; chest adorned with four gray stripes; breast tinged with gray; abdomen elliptical, deep velvet-like black, longer and a little broader than the chest; each segment adorned with a triangular, black, shining spot in the middle, and with a hoary spot on each side; hind borders shining; legs black; knees and feet ferruginous, the latter pitchy towards the tips; foot-cushions and claws tawney; tips of the claws black; hind thighs thick, unarmed; hind shanks curved; wings pale gray; wing-ribs and veins black; veins pitchy towards the base; poisers yellow."—Walker, l. c.

"Is a very peculiar species; it is represented in the British Museum by two (♂ and ♀) well-preserved specimens. I have never seen it elsewhere."—Osten Sacken, Cat. Dipt., 250, note 235.

Helophilus flavifacies.

Helophilus flavifacies Bigot, Ann. Soc. Ent. Fr., 1883, 344.

Habitat.—Maryland (Bigot).

♂. Long. 9^{mm}. Antennis testaceis; facie pallide flava, fronte superne fusca; thorace nigro, vittis quatuor flavis; scutello fulvo; abdomine nigro, utrinque tribus maculis trigonis, marginibus segmentorum 3 et 4, 5° toto, flavo pictis; calyptris et halteribus testaceis; pedibus pallide fulvis, femoribus posticorum apice, tibiis id. basi et apice, fusco annulatis, tarsis posticis obscure fulvis; alis pallidissime flavis.

Antennes fauves; face d'un jaune blanchâtre; front de même couleur, la moitié supérieure brune; thorax d'un noir opaque avec quatre bandes longitudinales jaunes, flancs couverts d'un duvet jaunâtre; écusson fauve, légèrement teint de noirâtre à la base et sur les côtés; abdomen d'un noir opaque, les segments 2^{e}, 3^{e} et 4^{e} avec, de chaque côté, une macule trigonale, la moins grande au 3^{e}, fauves, bords postérieurs des 3^{e} et 4^{e} segments testacés, 5^{e} entièrement d'un jaune testacé; pieds d'un fauve pâle, les postérieurs avec *trois* anneaux bruns, l'un, sis à l'extrémité des cuisses, les deux autres, sur les tibias, tarses postérieurs d'un fauve brunâtre; ailes très légèrement jaunâtres. 1 specim.—Bigot, l. c.

Helophilus Novæ Scotiæ.

Helophilus Novæ Scotiæ Macquart, Dipt. Exot., 2^{e} Suppl., 60, 10.

Habitat.—Nova Scotia (Macq.).

♀. Long. 12.5^{mm}. *Ater. Thorace vittis flavis. Abdomine fasciis albidis. Antennis pedibusque nigris; tibiis basi rufis.*

Face et front jaunes, à duvet blanchâtre et bande noire; style des antennes brun. Côtés du thorax noirs; écusson brun. Les bandes de l'abdomen étroites; celles des premier et deuxième segments élargies et fauves sur les côtés; ventre noir, à incisions blanchâtres. Jambes intermédiaires fauves, à extrémité brunâtre. Ailes assez claires; première nervure transversale située au-delà de la moitié de la cellule discoïdale.

ADDITIONAL NORTH AMERICAN SPECIES.

Helophilus formalis [*femoralis*] Walker, List, etc., iii, 603.—Mexico.

Helophilus Androclus Osten Sacken, Cat. Dipt., 250, note 230; Walker, List, etc., iii, 612 (*Eristalis*).—British Possessions.

Helophilus frater Osten Sacken, Cat. Dipt., 250, note 230; Walker, List, etc., iii, 613 (*Eristalis*).—Hudson's Bay Territory.

Helophilus chalepus Osten Sacken, Cat. Dipt., 250, note 230; Walker, Dipt. Saund., 247 (*Eristalis*).—Canada.

Baron Osten Sacken from an examination of the types of these species, described as *Eristalis*, ascertained that they belong to the group of *H. borealis*, *groenlandicus*, and *glacialis*. They cannot be recognized from the descriptions.

PTERALLASTES.

Pterallastes Loew, Centur., iv, 80, 1863.

Head broader than the thorax, much flattened. Eyes bare, broadly contiguous in the male. Frontal triangle small, antennal prominence short, obtuse. Antennæ inserted rather below the middle of the head in profile, rather small; first two joints short, third joint rounded; arista basal, bare. Face in the male nearly perpendicular, not descending far below the eyes, in profile gently concave above and more gently convex below, arched, not carinate; in the female concave; obliquely truncate below; cheeks narrow, the lower border forming with the plane of the occiput a little more than a right angle. Scutellum wholly yellowish opaque like the dorsum of the thorax. Abdomen elongate oval, nearly twice as long and broader than the thorax, broadest at tip of second segment, thence gently narrowed to the tip of the fourth. Legs wholly unarmed, rather stout; hind femora moderately thickened, elongate, below with short bristly hairs; hind tibiæ considerably arcuate, flattened. Marginal cell of wing open, third vein with a deep sinuosity into the first posterior cell; anterior cross-vein very oblique, near outer third of discal cell, last section of fourth vein strongly sinuate, terminating near the tip of third vein; sixth vein nearly straight.

Large, rather thickly pilose, moderately elongate species. Thorax densely yellowish pollinose; abdomen black, shining. Type of genus, *P. thoracicus* Loew, North America.

Pterallastes thoracicus. (Plate VIII, figs. 9, 9*a*.)

Pterallastes thoracicus Loew, Centur., iv, 80.

Habitat.—Pennsylvania!

♂. Length, 9 to 12.5^{mm}. Face black, rather thickly covered with grayish pollen, the cheeks bare and shining. Antennæ reddish-brown. Frontal triangle more thickly clothed with yellowish dust. Thorax and scutellum very thickly clothed with opaque, ochraceous pollen, leaving only a faint, slightly brownish, median stripe; pile abundant, not very long, wholly yellow. Pleuræ black, lightly dusted, moderately shining, except a brown stripe down the middle, which is thickly gray pollinose and gray pilose. Abdomen brownish-black, wholly shining; pile yellow, broadly black pilose on the middle of the fourth segment behind. Legs black; coxæ rather thickly gray pollinose, the knees narrowly on the front legs, knees and base of tibiæ on the middle and hind legs and their tarsi, light yellow, the extreme tip of four hind tibiæ sometimes yellow, and the front tarsi somewhat reddish below. Wings distinctly infuscated, especially beyond the anterior cross-vein; faint clouds on all the cross-viens.

♀. Face concave; front of moderate width, thickly luteous pollinose a large black spot above the antennæ black, shining, vertex black. Loew, l. c.

I have two male specimens from Mr. E. Keen, of Philadelphia. Loew describes the abdomen as "shining black, obsoletely bluish."

TEUCHOCNEMIS.*

Tuechoonemis Osten Sacken, Bull. Buff. Soc. Nat. Sci., iii, 58, 1876; Cat. Dipt., note 237, p. 250.

Rather large, elongate, moderately pilose species, black and yellow. Head short; face not tuberculate, not produced; the margin of the cheeks forming not much more than a right angle with the plane of the occiput. Antennæ short, third joint transverse; arista bare. Legs stout, hind femora thickened, especially in the male. Hind tibiæ arcuate and provided with a stout, internal, median spur in the male. Marginal cell of wings open, third vein with a moderately deep curve into the first posterior cell.

Type of genus, *T. lituratus* Loew, North America.

This genus cannot be separated easily from *Mallota*, and may have to be abandoned. The character upon which Osten Sacken based it, was the peculiar spur on the internal part of the hind tibiæ; but, as will be seen, this character occurs, apparently as only a dimorphism, in *Mallota cimbiciformis*, and hence has no value here as a distinguishing mark. The species are much more bare than in our species of *Mallota*, and the general habitus, especially of *T. bacuntius*, is very different. The last species reminds one forcibly of the more *Milesia*-like forms.

TABLE OF SPECIES.

Abdomen wholly black	**lituratus**
Abdomen in large part yellow or luteous	**Bacuntias**

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* *Τεῦχος*, armor; *κνημη*, tibia.

Teuchocnemis lituratus. (Plate VIII, figs. 12, 12*a*.)

Pterallastes lituratus Loew, Centur., iv, 81.

Teuchocnemis lituratus Osten Sacken, Bull. Buff. Soc. Nat. Sci., 58, 1876; Cat. Dipt., 250.

Habitat.—Pennsylvania, Connecticut, Missouri!

♂, ♀. Length, 10 to 12^{mm}. Black, moderately shining. Head dilutely luteous or yellow; occiput, except the margin, cinereous, opaque; cheeks black, shining. Antennæ scarcely darker than the face. Dorsum of thorax with grayish or yellowish-gray pollen and thin obscure yellowish pile, subopaque; on each side of the middle a slender opaque black stripe, abbreviated both in front and behind; just above the wing a reddish elongate spot, and the humeri also sometimes of the same color. Scutellum luteous, the base blackish. Abdomen black, somewhat shining, with short, thin, white pile. Legs black; front femora at the ends and more or less below, base of their tibiæ, middle tibiæ for the larger part, and the middle tarsi, except the tip, hind femora at base, along the under sides, the tibiæ at base and tip, and the tarsi except the tip, light yellow; in the female the hind legs may be wholly reddish-yellow, except the tip of tarsi. Wings brownish, with an elongate hyaline spot in the first and second basal cells; narrow clouds along the base of the first and fifth veins.

Two specimens, New Haven, Conn., and Missouri (Mr. Theo Pergande).

Teuchocnemis Bacuntius. (Plate VII, fig. 6.)

Milesia Bacuntius Walker, List, etc., iii, 563.

Teuchocnemis Bacuntius Osten Sacken, Bull. Buff. Soc. Nat. Sci., iii, 58; Cat. Dipt., 135, notes 237, 238, p. 250.

Habitat.—Georgia, Texas!

♂, ♀. Length, 12^{mm}. Face light yellow, thinly light-yellow pollinose Antennæ reddish yellow; cheeks and occiput reddish yellow, narrowly whitish pollinose along the orbits. Front of female like the face; pile light yellow. Dorsum of thorax black, the broad lateral margin extending a little inwards at each humerus, and a large triangular spot in front of the scutellum, the scutellum and a large spot on the mesopleuræ yellowish red; pile of dorsum moderately abundant, erect; yellow. Abdomen brownish black, the lateral angles of the first segment, the second, third, and fourth segments with two very large coalescent spots, extending from the posterior nearly to the anterior margin, but broadly connected behind, and the fifth segment wholly reddish yellow; in some specimens the picture is not distinct, and the yellow more or less broken up in brown, in part perhaps due to the effect of drying. Legs reddish yellow, the base of all the tibiæ pure yellow. Hind femora in the male very much swollen; in the same sex the coxæ are provided with an obtuse tubercle, and the tibiæ on the front side, near the middle, have a strong projecting tubercle; in the female the femora are only a little thickened, and the tibiæ are not provided with the spine. Wings strongly tinged with brownish, especially in front, a streak along the first basal cell nearly hyaline; third longitudinal vein with a rather deep curvature into the first posterior cell.

Two specimens (♂ and ♀) in Baron Osten Sacken's collection at the Museum of Comparative Zoology, bearing the label "Dallas, Tex., Boll.," and a specimen in Professor Riley's collection.

MALLOTA.*

Mallota Meigen, Syst. Beschr., iii, 377, 1822.

Head somewhat flattened, broader than the thorax. Face concave below antennæ and with a large obtuse tubercle; antennæ short, third joint broader than long, arista bare. Eyes in the male contiguous or separated only by a sutural space; pilose or naked. Scutellum large. Abdomen short, much convex above. Legs strong, hind femora extraordinarily thickened and bent, the hind tibiæ sometimes with a stout spur in the middle in front in the male. Wings with the marginal cell open; third longitudinal vein deeply bent into the first posterior cell; the fourth vein terminates near the tip of the third; anterior cross-vein oblique, situated near the middle of discal cell. Large, black, shining species, densely pilose.

TABLE OF SPECIES.

1.—Eyes pilose; more or less of the base of the abdomen with yellow pile, **posticata**
Eyes bare; abdomen wholly black pilose 2
2.—Eyes of male separated by a narrow suture in front of the ocelli; wings with a distinct brown spot . . . . **Sackeni**
Eyes of male quite contiguous; wings indistinctly, or not at all spotted. Hind tibiæ of the male with a stout spur in the middle (form *Bautias*), or wholly without such spur . . . . **cimbiciformis**

Mallota posticata. (Plate VIII, fig. 13.)

Eristalis posticatus Fabricius, Syst. Antl., 237, 21; Wiedemann, Auss. Zw. Ins., ii, 194, 62 (translation from Fabricius).
Milesia barda Say, J. Acad. Phil., vi, 163; Compl. Wr., ii, 357 (male, not female).
Eristalis coactus Wiedemann, Auss. Zw. Ins., ii, 165.
Imatisma posticata Macquart, Dipt. Exot., ii, 2, 68 (male, not female).
Merodon Balanus Walker, List, etc., iii, 600.
Merodon bardus Packard, Guide Study Ins., 399, fig. 319; Amer. Nat., ii, Jan., 1869, 593; pl. 12, figs. 10, 10*a*; Glover, MS. notes Jour. Dipt., 1874, p. 32; pl., viii, fig. 30.
Mallota barda Osten Sacken, Cat. Dipt, 135, 249.
Mallota posticata Williston, Berl. Ent. Zeit., xxvii, 170; Lintner, First An. Rep., 211, fig. 64.

Habitat.—New England, Canada, New York, Kansas!, Indiana (Say).

♂, ♀. Length, 11 to 15^{mm}. Eyes pilose, contiguous in the male for a little longer distance than in *M. cimbiciformis*. Face black, with light yellowish-white dust and pile, median stripe and cheeks shining; frontal triangle clothed with the same dust as the face, except just below the base of the antennæ, where it is shining, pile yellowish or blackish; vertex black, with black pile. Front in female clothed with black pile, more or less intermixed with yellow; pile of occiput yellow, blackish

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[*] Μὰλλωτός, woolly.

towards the top. Antennæ brown or blackish, third joint nearly orbicular. Thorax black, opaque on the disk, in front and on the sides brownish when denuded; dorsum thickly covered with bright yellow furry pile, less abundant on the middle, where it is sometimes intermixed with black, or not seldom quite black. Scutellum yellow, black at base; pile yellow. Abdomen black, with abundant black and yellow pile; the yellow pile varies much, usually it is confined to the first and basal part of the second segment, at other times comprising nearly the whole of the third segment. When denuded of pile the abdomen often shows considerable red on the second and third segments. Legs black; tips of femora, the tarsi, and sometimes a large portion of the tibiæ, red; pile chiefly black, but with more or less yellow, especially on the front and middle pairs; hind femora much swollen, arcuate in the male, hind tibiæ compressed, especially in the male. Wings nearly hyaline, usually with a small, faintly brownish spot opposite the tip of the auxiliary vein.

This fly shows a striking resemblance to *Eristalis flavipes*, with which, indeed, it was confounded by Say in his description of *Milesia barda*, the female of which belonged to the former, the male to the present species. They are not only strikingly similar in appearance, but they vary in the same way, namely, in the amount of yellow and black pile on the thorax and abdomen. Thus, as I have shown elsewhere, *Eristalis melanostomus* is a simple variety of *E. flavipes*, corresponding quite to *M. posticata*, variety *barda* of Say. I have found the species rather common in Connecticut. The description is based chiefly upon fifteen specimens collected in June, from about blossoms of the blackberry and dogwood (*Cornus paniculata*), in company with *M. cimbiciformis*. Other specimens I have compared from Canada (William Brodie), New York (Professor Lintner), Kansas (Professor Popenoe), and Pennsylvania (E. Keen).

For discussion of the synonymy of this species see the following:

Mallota cimbiciformis. (Plate VIII, fig. 11, and Plate IX, fig. 8.)

Syrphus cimbiciformis Fallen, Syrph., 27, 18.

Eristalis cimbiciformis Meigen, Syst. Beschr., iii, 385, 3.

Imatisma posticata, Macquart, Dipt. Exot., ii, 2, 68 (female only); tab. xii, fig. 2; Loew, Neue Beitr., iv, 17; id., Amer. Jour. Sci., 2nd series, xxxvii, 317.

Mallota posticata Schiner, Dipt. Austr. in Verh. Zool. Bot. Gesells., vii, 402; id., Fauna Austr., i, 343; Osten Sacken, Cat. Dipt.

Mallota cimbiciformis Schiner, Nov. Exped., 300; Williston, Berl. Ent. Zeitschrift, xxvii, 171.

Merodon Bautias Walker. List, etc., iii, 600.

Mallota Bautias Osten Sacken, Cat. Dipt. and note 239, p. 250; Karsch, Berlin Ent. Zeit., xxvii, 172.

Mallota atrox (Berlin Museum) Karsch, l. c.

Mallota dentipes (Williston) Lintner, First An. Rep. of the Entomologist, 211.

Habitat.—Georgia, Indiana, Pennsylvania, New York, Connecticut, New Hampshire, Canada!

♂, ♀. Length, 13 to 16^{mm}. Eyes bare, contiguous for a short distance below the ocelli in the male. Front in female narrowed above, black, shining, except on the sides below the ocelli, where it is narrowly but thickly dusted, like the face; pile black, intermixed with yellowish across the middle and at the vertex. In the male the frontal triangle is thickly dusted like the face, except just above the base of the antennæ; the pile is usually black, sometimes almost wholly yellowish. Face deeply concave below the antennæ to tip of tubercle, produced moderately downward, thickly covered on the sides with grayish or whitish pollen, leaving a broad median stripe and cheeks shining black. Antennæ brownish-black, the third joint somewhat reddish; arista reddish. Posterior orbits thickly dusted with whitish. Dorsum of thorax in its ground color moderately shining on the disk, pollinose in front, the color concealed beneath thick, furry, light-yellow pile. Scutellum light yellow, with similar colored pile; pile of pleuræ thicker and a little lighter colored. Abdomen short, convex, obtusely conical, deep shining black, with short, erect, black pile, longer towards the tip; the first segment is grayish pollinose, and the pile slightly intermixed with whitish; venter black, the basal segments more or less pale. Legs deep black, with black pile, the tarsi dark reddish, slightly or not all so, however, on the hind pair; posterior femora very much thickened; in the male extraordinarily so, and arcuated; posterior tibiæ compressed, especially in the male. Wings hyaline, sometimes with a distinct brown spot near the furcation of the second and third veins and the tip of the auxiliary vein.

Form *cimbiciformis*. Hind tibiæ in male moderately compressed, wholly without a spur in the middle; usually smaller specimens.

Form *Bautias*. Hind tibiæ in the male extraordinarily compressed, and with a stout angular projection in the middle, which, when the tibia is flexed, lies on the outer side of the femur; usually larger specimens.

A very singular species, which is apparently dimorphic in the male. Of the form without the spur I have two males taken in company with two other males of the spurred form, June 20, near New Haven, about the blossoms of *Cornus paniculata*. They are smaller than the smallest of all my spurred specimens, but otherwise I can see no differences whatever. With these four males just mentioned I captured four females, all of which were larger than the unspurred males. A single female from Indiana, however, agrees very well in size with these unspurred males, but shows no other differences from the other females. I have also six males and an equal number of females, all of them large and all of the males with spurs, collected near the base of Mount Washington, July 25–28. Another spurred male I have seen from Pennsylvania (E. Keen) and a female from Canada (William Brodie).

There are some minor differences in these specimens which it will be worth while to notice. The pile of the legs is usually wholly black, at other times much intermixed with yellow; the same may be said of the black pile of the front. The black pile of the posterior part of the abdomen is sometimes a little intermixed with reddish, but in none do I find any but black pile on the second segment, a fact which will readily enable the species to be distinguished from *M. posticata.*

In the synonymy of the species there has been much confusion. The first one who published anything in regard to American specimens was Macquart. He, unfortunately, from their close resemblance, supposed the single female specimen which he examined to belong with the male type of Fabricius' *Eristalis posticatus*, at that time in Bosc's museum, at Paris, and which he used in describing the species. In the present species the eyes are bare, while in Fabricius' types the eyes are pilose, according to Macquart; this, together with the fact that the base of the abdomen is never yellow pilose (the sparse light hairs on the first segment are very inconspicuous), renders it certain that the present cannot be *Eristalis posticatus* Fabr., as has been supposed by later authors. On the other hand, there can hardly be any doubt that the species described by Say as *Milesia barda* (male) is the true *E. posticatus* of Fabricius.

The description of *cimbiciformis* as given by Fallen does not quite agree with this, and comparison is needed with European specimens before the identity can be actually settled or denied. Loew believed the species to be the same.

The flight of this fly is a little peculiar, and will enable one to readily distinguish it from its very near ally, *M. posticata.* It flies with a loud buzz, going here and there, in and about the patches of flowers.

Mallota Sackeni. (Plate VIII, fig. 14.)

Mallota posticata Osten Sacken, West. Dipt., 338.
Mallota Sackeni Williston, Proc. Am. Phil. Soc., xx, 324.

Habitat.—Washington, Texas!

♂. Length, 14^{mm}. Closely allied to *M. cimbiciformis*, but differs in the presence of a dark brown spot on the wings, and in the eyes of the males being distinctly separated.

Face black, covered with thick light yellow pollen and pile, a broad median stripe and the cheeks shining. Antennæ black, the third joint more brownish, the angles apparently less rounded than in the preceding species. Frontal triangle covered with the same dust and pile as on the face, except in the middle where it is shining. Eyes bare, convergent below the ocellar triangle, but separated by a very distinct interval. Thorax black, thickly covered on the dorsum, scutellum, and pleuræ with erect, furry, light yellow pile; scutellum light yellow. Abdomen black, shining, clothed with black pile; on the first segment slightly intermixed with light colored. Legs black; extreme tip of femora, base of tibiæ, and the tarsi, obscure yellowish. Hind femora much swollen and bent, hind tibiæ compressed. Wings hyaline with a large brown spot, extending from the furcation of the second and third veins to the anterior cross-vein and from the costa to the base of the third posterior cell. Marginal cell closed in the costa.

One specimen.

It is not impossible that more material will render these characters of less value in separating this species from the foregoing.

Four males from Waco, Texas, in the National Museum, since examined, all agree in the dichoptic character, and the brownish spot on the wings. The marginal cell is open. The body is more elongate, and the pile of the thorax more fulvous than in *M. cimbiciformis.*

Mallota bipartita.

Merodon bipartitus Walker, List, etc., iii, 599.
Mallota bipartita Osten Sacken, Cat. Dipt., 135.

Habitat.—Georgia (Walk.).

"♂. *Niger, antennis piceis setis fulvis, pedibus nigris tibiis basi pedibusque subtus ferrugineis, aliis subcinereis fusco ad costam unimaculatis.*

"Body black, head shining, clothed with tawny and black hairs, prominent about the mouth, which is black; feelers pitchy; bristle tawny; eyes black; all the facets very small; chest thickly clothed with yellowish-white hair; abdomen linear, shining, a little longer and broader than the chest, thinly clothed with short tawny hairs, covered more thickly toward the tip with black hairs; legs black, clothed with short black hairs; shanks ferruginous towards the base; feet ferruginous beneath; claws and foot-cushions tawny; tips of feet black; wings slightly gray with a small brown spot under the middle of the fore-border; wing-ribs and veins pitchy; veins tawny toward the base and along the fore-borders; poisers tawny. Length of the body, 4½ lines; of the wings, 10 lines." Walker, l. c.

"*Merodon Bautias* Walker is represented in the British Museum by a single male specimen; *M. bipartitus* by four specimens, two of which seem to be females of *M. Bautias;* the two others may be a different species." Osten Sacken, l. c.

TRIODONTA.*

Polydonta Macquart (non Fischer), Dipt., Exot. 4ᵉ Suppl., 144, 1850.
Triodonta Williston, Bull. Brookl. Entom. Soc., vii, 136, 1885.

Differs from *Mallota* in the eyes of the male being broadly separated, bare; in the male hind coxæ, hind femora, and tip of hind tibiæ being provided with spurs or protuberances; in the abdomen of the male being narrowed posteriorly, and in the general pilosity being much less. In our single species the color of the abdomen in the two sexes is strikingly different.

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* *Τριόδους*, with three teeth.

Triodonta curvipes. (Plate IX, figs. 1, 1*a*, 1*b*, 1*c*, 1*d*.)

Merodon curvipes Wiedemann, Auss. Zw. Ins., ii, 149, 3.
Helophilus albiceps Macquart, Dipt. Exot. 1er Suppl., 132, 9 ; pl. fig. 7.
Polydonta bicolor Macquart, Dipt. Exot. 4e Suppl., 144, 1 ; pl. xiii, fig 6.
Polydonta curvipes Osten Sacken, West. Dipt., 338; Williston, Proc. Am. Phil. Soc., xx, 324.

Habitat.—New England!, Colorado, California (O. S.).

♂, ♀. Length, 10 to 13mm. Face black, shining on the tubercle and the cheeks; elsewhere thickly covered with yellowish pollen and pile. Antennæ black; arista yellowish at the base and end. Front in male black on the upper part and above the base of the antennæ; elsewhere covered with yellowish dust. In the female the front is broad, shining in the middle below, blackish above, pile near the ocelli blackish; on the occiput white. Thorax black, covered thickly with a brownish dust, leaving faint indications of a slender median and lateral stripes, and with short, rather abundant, obscure, yellow pile. Pleuræ dusted with white; scutellum sub-translucent yellow. Abdomen with short pile; in the male as follows: First segment black; second segment black in front, except at the sides, dilated in the middle in a broad sub-triangular spot, reaching two thirds of the length of the segment; remainder of the abdomen yellowish red; in the female black, partly shining; first segment and second, except posterior part, thickly dusted with grayish; third and fourth segments on the front part with a broad interrupted band of the same dust; on the fourth sometimes only two rounded spots. Legs black; tip of femora and base of tibiæ yellowish red. Wings nearly hyaline.

Numerous specimens.

TROPIDIA.*

Tropidia Meigen, Syst. Beschr., iii, 346, 1822.

Medium sized, nearly bare species; black, with yellow markings on the abdomen. Head hemispherical, somewhat broader than the thorax. Antennæ short, third joint rather large, not much longer than broad, the anterior angles only a little rounded; arista bare. Face with a median keel-like ridge; not produced, obliquely truncate; cheeks narrow below the eyes. Eyes bare, contiguous in the male. Thorax short and rather broad. Scutellum large, its border thin; more or less yellow. Abdomen narrow, somewhat elongate, of nearly equal width, depressed. Wings folded together in rest; marginal cell open, third vein with a moderate curvature, sometimes deeply bent into the first posterior cell, anterior cross-vein beyond the middle of discal cell, oblique. Legs strong; hind femora extraordinarily thickened, below near the outer end with an angular projection; hind tibiæ bent.

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* Τροπιδια, a keel.

TABLE OF SPECIES.

a.—Femora black, at the tip testaceous; the hind femora below, near the base, with a strong mammiform process (♂)	**mamillata**
b.—Front and middle femora yellow on distal end; hind femora without such process near the base	**quadrata**
c.—Antennæ large, reaching nearly to the oral margin; hind coxæ of male with a large obtuse spur	**calcarata**

Tropidia quadrata. (Plate IX, figs. 2*a*, 2*b*.)

Xylota quadrata Say, Amer. Ent., i; tab. viii; Compl. Wr., i, 14; Wiedemann, Auss. Zw. Ins., ii, 101, 6 (translation from Say).
Tropidia quadrata Macquart, Dipt. Exot., ii, 2, 72.
? *Tropidia albistylum* Macquart, Dipt. Exot. 2e Suppl., 60, 1; tab. 2, fig. 10.

Habitat.—New England, Canada, Washington Territory!

♂, ♀. Length, 9 to 12^{mm}. Front in female narrow above, black, shining below and at the vertex, on the sides thickly yellowish gray-dusted; pile very short and sparse, yellowish. Vertical triangle small, black, with black pile; frontal triangle small, colored like the face. Face gently convex in profile in the male, a little concave near the middle in the female; in color reddish or brownish yellow, densely covered with yellowish gray pollen, leaving a slender median stripe shining black, a stripe or spot on the cheeks also black. Antennæ reddish yellow, the third joint nearly square. Dorsum of thorax shining, greenish black, with two rather distinct median pollinose stripes, narrowly separated, becoming obsolete near the middle; two spots of the same colored pollen in front of the scutellum, another in front of each post-alar callus, on the humeri, and a spot along the dorso-pleural suture immediately behind the humeri. Pleuræ wholly thickly whitish pollinose. Scutellum yellow along the border. Abdomen reddish-yellow; in the male the first segment black, whitish pollinose, yellow on the sides; second segment in front (but not reaching the sides) and a narrow median stripe black, behind extending narrowly to the sides, more brownish, or only slightly brownish, except at the outer ends, forming an inverted T, posterior margin of the segment yellow; third segment with a median narrower black or brown stripe, not reaching the front, and on the hind part more or less indistinctly brownish like the preceding; fourth segment on the disk mostly brownish-black with yellowish pollen. In the female the black on the second segment is broader; the third segment black, except a quadrangular spot in front on each side, and the hind margin, yellow. Front and middle legs, on the basal half or more of the femora, black, reddish yellow elsewhere, except that the tibiæ may be somewhat brownish before the tip. Hind legs black, the knees only yellow. Wings hyaline, third longitudinal vein moderately bent into the first posterior cell.

Twenty-nine specimens, Canada (Brodie), Washington Territory (Morrison), Connecticut.

The synonymy of *T. albistylum* seems probable; the only difference that the description seems to indicate is that the front and middle femora are more broadly yellow. The third longitudinal vein of the wing is represented straight in his figure, but Macquart's figures generally are unreliable.

Tropidia mamillata.

Tropidia mamillata Loew, Centur., i, 68.

Habitat.—Illinois!

♂. Length, 8mm. Face carinate, with whitish pollen. Antennæ light ochraceous. Dorsum of thorax blackish bronze, shining. Pleuræ cinereous pollinose. Abdomen near the base black, near the tip fuscous, with two interrupted reddish bands. Femora black, at the extreme tip testaceous; hind femora on the lower side near the base armed with a strong mammiform process. Front and middle tibiæ simple, reddish yellow; hind tibiæ dilated, arcuate, fuscous black, base and upper side reddish, the tip produced into a tooth. Tarsi reddish-yellow, fourth joint black, the fifth joint in the hind pair or in all fuscous. Halteres whitish. Wings cinereous hyaline; stigma yellow.

Translation, compared with the type. Will be very readily recognized by the mammillate tubercle on the under and inner side of the base of the hind femora; it is long and directed inwards and backwards.

Tropidia calcarata, n. sp.

Habitat.—Michigan!

♀. Length, 9mm. Head black; face and front lightly gray pollinose. Antennæ brownish yellow; third joint very large, reaching nearly to the oral margin, subquadrate; arista black. Face but little produced below the eyes, the lower margin of the cheeks nearly straight and perpendicular to the plane of the occiput. Thorax black, but little shining; humeri and pleuræ pollinose. Abdomen opaque, black, or dark brown, the lateral margins of the second and third segments (broader in front of each) yellow; both of these segments with linear hind margins; fourth segment almost wholly light-grayish pollinose, with a yellow hind margin. Legs dark-brown or black, the base of tibiæ, and the three basal joints of front and middle tarsi, yellow. Wings brownish, clouded on outer half.

♂. Third antennal joint smaller. The yellow margins of the second and third abdominal segments extend further inward. Hind coxæ with a large obtuse spur; hind tibiæ with a terminal spur.

One male, three females, Galesburg, Michigan (Dr. Dimmock, National Museum, Prof. Riley's collection).

The third joint of the antennæ is much larger, the face shorter, the dorsum of thorax apparently without the pollinose stripes, the yellow markings of the abdomen less extensive, and the hind coxal spur, at once distinguish this species from *T. quadrata*; from *T. mamillata* it is as readily separated by the absence of the basal femoral spur.

CRIORHINA.[*]

Criorhina Hoffmannsegge in litt.; subgenus, Meigen, Syst. Beschr., iii, 236 (1822); St. Fargeau and Serville. Encycl. Meth., x, 518 (1825); genus, Macquart, Hist. Nat. Dipt., i, 497 (1834).

Somula Macquart, Dipt. Exot. 2e Suppl., 57, 1847.

Eriophora Phillipi, Verh. Zool. Bot. Gesell., xv, 736, 1865.

Eurhinomallota Bigot, Annales Soc. Ent. France, 1882; Bull., No. 6.

Brachymyia Williston, Can. Ent., xiv, 77, 1882.

Medium to large sized species, black or greenish black, with or without light ground markings. Head much flattened, broader than the thorax. Antennæ situated upon a prominent conical frontal process, third joint orbicular, or broader than long; arista bare. Face moderately produced below the eyes, downward or forward, in profile with a greater or less convexity in the middle. Eyes bare. Scutellum dark, not translucent. Abdomen elliptical or very short oval. Legs strong, hind femora not, or but little, thickened (*verbosa*), without projections or bristles below, hind tibiæ sometimes compressed and bent. Marginal cell of wings open, third vein nearly straight, cross-vein beyond the middle of discal cell, oblique.

Sub-genus CRIORHINA. Face produced downwards, and forwards, the proboscis more or less elongate. Eyes separated in the male. Large, thickly pilose species, the ground-color black, without light bands or spots.

Sub-genus CYNORHINA[†] (new). Face produced downwards, convex below, proboscis short. Eyes contiguous in the male. Moderately pilose species, the ground-color with yellow markings. Type *C. analis* Macq. (also *Cr. fallax* Linné, Europe).

Sub genus SOMULA. Face produced downwards, convex below, proboscis short. Eyes well separated in the male. Moderately pilose species, in large part yellow. See page 216.

The genus *Criorhina* is much confused. Meigen in 1822 (Syst. Beschr., iii, 236) divided the genus Milesia into two sub-sections, A and B. Section A was designated as "Fein haarige," and included the modern Milesia, Spilomyia, and Temnostoma. Section B he gave as "Wollige. (Criorhina Hgg.)", including in the following order the species, *M. apicata* Meig. (= *apiformis* Schrank), *berberina*, *oxacantha*, *flocosa*, *asilica*, *ruficauda*, and *ranuncula*. The first of these was figured as typical. Macquart (Hist. Nat. Dipt., i, 497) in 1834 defined the genus, retaining the species in the same order and adding several others, and also figuring the first as the typical species. Meanwhile St. Fargeau and Serville (Encycl. Meth., x, 518, 1825) had made *apiformis* Schrank, with which *apicata* was afterward shown to be synonymous, the type of a new genus, from the structure of the face (*Pocota*). The genus can only thus date from 1834, and be based upon Macquart's description rather than upon his most typical species. His definition of the genus is as follows: "Corps epais, velu. Face prolongée inféreurement, à légère proéminence. Front étroit, non linéaire ♂. Antennes insérées sur une saillie du front, première article un peu allongé, troisieme plus large que long. Jambes postérieures arquées et comprimées. Ailes écartées, première cellule postérieure à base oblique."

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[*] Κριός, a ram; and 'Ρίς, nose.

[†] Κυών, a dog; and 'Ρίς, nose.

TABLE OF SPECIES.

CRIORHINA.

1.—Legs wholly black; abdomen thickly black pilose in the middle; tip of fourth vein bent inwards . . . . nigripes
Legs in part red or yellow 2
2.—First joint of antennæ only a little elongate; tibiæ, except a small ring, and the tarsi, red . . . . verbosa
First joint of antennæ considerably elongate; proboscis long; base of tibiæ yellow; tarsi in large part black . . . . lupina

CYNORHINA.

1.—Face without yellow, produced somewhat forwards below, second segment of abdomen broadly and third and fourth narrowly on the sides yellow, umbratilis
Face in large part yellow 2
2.—Face with a median shining black stripe; second segment of the abdomen on the sides, continued more narrowly on the third yellow . . . intersistens
Face yellow, without a median black stripe 3
3.—Abdomen wholly black . . . . armillata, nigra
Abdomen with yellow 4
4.—Front of female wholly yellow; abdomen black, except a large part of the fourth and the whole of the fifth segments, which are bright orange yellow analis
Front of female black on upper part; abdomen with yellow spots or bands . . 5
5.—Abdomen with two to four pairs of yellow side spots, touching the lateral margins humeralis, notata
Abdomen with cross-bands, the first interrupted, the others entire . . scitula

Criorhina nigripes. (Plate X, figs. 1, 1*a*.)

Brachymyia (*Eriophora*) *nigripes* Williston, Can. Ent., xiv, 78, 1882.
Eurhinamallota nigripes Williston, Proc. Am. Phil. Soc., xx, 330, 1882.

Habitat.—California!

♀. Length, 13mm. Antennæ nearly black, first joint scarcely longer than the second, third joint broader than long, the front border only gently convex. Face in the middle gently convex, thickly covered on the sides with yellowish-white pollen, the median stripe and broad cheeks shining, the latter thinly yellowish pilose. Front moderately broad, shining black, with black pile, on the vertex with yellow pile. Proboscis not very long. Posterior orbits rather broad, yellowish dusted and with long, yellowish white pile. Thorax with abundant, rather long yellowish pile in front, black across the middle between the wings, behind yellow, abundant and bushy on the post-alar callosities, quite long and thick on the scutellum. Pleuræ with dense yellow pile. Abdomen very short, broad, with abundant pile, shining black, the second segment opaque; an opaque, laterally abbreviated cross-band on the third segment; pile on the sides of the first and second segments and on the fourth and fifth, longer, yellow, elsewhere black. Legs wholly black, with long yellowish pile. Wings with a distinct blackish shade on outer part.

Five specimens (Morrison, Baron).

Criorhina lupina. (Plate IX, figs. 6, 6*a*, 6*b*.)

Brachymyia lupina Williston, Can. Ent., xiv, 77, 1882.
Eurhinamallota lupina Williston, Proc. Am. Phil. Soc., xx, 330, 1882.
? *Eurhinomallota metallica* Bigot, Bullet. bi-mens. Soc. Ent. Fran. (diagnosis only), 1882.

Habitat.—California!

♂, ♀. Length, 9 to 12^{mm}. Black, shining. Antennæ brownish-black, third joint at the base sometimes, second joint at the tip, and first joint at the base, reddish; first joint twice the length of the second, third broader than long. Face thickly clothed with yellowish white pollen and pile, a broad median stripe and the cheeks shining. Front in female broad, dusted on the sides, pile long and yellowish on the sides; much produced downwards and forwards, conical; in the male the frontal process very prominent and the eyes well separated by the swollen ocellar callosity. Posterior orbits thickly light gray pollinose and pilose. Thorax shining metallic black; clothed with moderately abundant and very long light-reddish yellow pile, on the pleuræ whitish. Abdomen shining black, with long, rather sparse, light-colored pile. Legs with long light-colored pile; black, the extreme tip of femora, basal third of tibiæ and basal joints of tarsi, yellowish or luteous, the tibiæ otherwise more of a brown color. Wings sub-hyaline, with a blackish shade on the outer part, the cross-veins in some specimens lightly clouded.

Four specimens. The proboscis in the female is as long as the thorax, somewhat shorter in the male.

Criorhina verbosa. (Plate X, fig. 2.)

Musca tomentosa Swederus, Vetensk., Ak. Nya. Handl., 1787.
Milesia verbosa (Harris) Walker, List, etc., iii, 568.
Brachypalpus verbosus Osten Sacken, Catalogue Dipt., 136, 1878.

Habitat.—Eastern States, Canada!

♀. Length, 16^{mm}. Large, black, shining, thickly pilose. Face thickly clothed on the side with yellowish-gray pollen, a median stripe from the base of the antennal process, and the cheeks, shining black. Front rather narrow, shining black, somewhat dusted on the sides, pile long, yellowish. Antennæ: first joint only a little elongate, nearly black; second joint red or brownish-red; third joint much broader than long, transversely oval, brownish-black, towards the base more or less reddish. Thorax a little shining above; densely pilose, in front and behind yellow, across from the root of the wings black. Pile of pleuræ yellow. Scutellum black, with long yellow pile. Abdomen short, broad, shining black, pile yellow, somewhat intermixed with black behind; on the first, second, and part of the third segment the ground color is obscured by grayish dust and more abundant pile. Legs deep red; femora, except the tip, black; a ring in the middle of the tibiæ deeper in color, or black. Wings hyaline, a little clouded on outer part.

Three specimens, from Massachusetts (Mr. S. Henshaw), Maine.

CYNORHINA.

Cynorhina, sub. gen. nov., ante, p. 209.

Criorhina (Cynorhina) umbratilis, n. sp. (Plate IX, fig. 7.)

Habitat.—Connecticut!

♀. Length, 10mm. Face black, thickly dusted with white on the sides, a median stripe and the cheeks shining. Antennal process rather small, the face considerably excavated below, produced downward and somewhat forwards. Antennæ reddish-brown, third joint large, orbicular. Front broader above than in the preceding species, mostly shining, with rather long yellowish pile; occiput black, with yellowish pile and gray pollen. Thorax shining black, with rather abundant, obscurely yellow pile, black across the middle, yellow on the scutellum and pleuræ. Abdomen short, oval; black, shining, with short black pile; sides of second segment broadly, the third less so, the fourth narrowly orange yellow; the ground color is, however, almost wholly obscured by thick woolly orange-yellow pile, extending less broadly on the sides of the third segment, and narrowly on the margin of the fourth; pile of second segment in the middle short, yellow. Legs black, with yellowish-white pile; base of middle femora, basal two-thirds of hind femora, basal end of front and middle tibiæ, and all the tarsi, except the last two joints and hind metatarsi, yellow. Wings somewhat brownish, lighter at the base, a darker cloud near the furcation of second and third veins.

One specimen, obtained from the blossoms of *Prunus virginianus*, in June, Connecticut.

Criorhina (Cynorhina) intersistens.

? *Xylota Badia* Walker, List, etc., iii, 559.
Eristalis intersistens Walker, List, etc., iii, 615.
Genus novum, badia Osten Sacken, Cat. Dipt., 138; note 248, p. 253, 1878.

Habitat.—White Mountains, New Hampshire, Pennsylvania, Minnesota!, New Jersey (Walk.).

♂, ♀. Length, 9 to 11mm. Face yellowish white, thickly covered with silvery dust, in the middle a shining black stripe, reaching from or near base of antennal process to oral margin; cheeks black, shining; antennæ black, third joint orbicular, brown. Front in female shining black, with dust on the sides. Frontal triangle black, shining, with dust near the orbits. Occiput black, with whitish pile and thickly covered with grayish dust. Thorax greenish-black, shining, with rather long dusky pile, more abundant and whitish on the pleuræ. Abdomen deep shining greenish-black, with short erect black pile, on the sides and on the last segment longer, yellowish white; second segment on the sides with a large yellow triangle, reaching the whole length of the segment and continuous on the side of the third, narrowly in the male, more broadly in the female, clothed with abundant yellow pile. Legs chiefly yellow, with light yellowish pile; front femora, except the tip, middle, except base and end, and the hind pair, except a broad preapical ring, and last three joints of all the tarsi, black; front tibiæ with a moderate, middle with a narrow ring beyond the middle, hind tibiæ, except base and tip, and hind metatarsi, except the tip, brownish or brownish-black.

Two specimens (Nos. 1510, 1511), from near Glen House, White Mountains, New Hampshire (Dr. George Dimmock). A single male specimen from Minnesota (from Mr. E. Keen) differs in the third joint of the antennæ being more yellowish and the front femora at the very base, yellow.

I do not doubt that this is Walker's *Eristalis intersistens;* nothing is said of the black facial stripe in *X. badia.* "The synonymy is doubtful, as the description of the face does not quite agree; it is principally based on my recollection of the types at the British Museum."—O. Sacken, l. c.

Three specimens (♂, ♀), from Fairmount Park, Pennsylvania, May 23, from Mr. E. Keen.

Criorhina (Cynorhina) armillata.

Criorhina armillata Osten Sacken, Bull. Buff. Soc. N. Sci., iii, 68; Cat. Dipt., 251, 1878.

Habitat.—Quebec (O. S.)!

"♀. Length, 11 to 12^{mm}. Face and front above the antennæ honey-yellow; upper part of front and vertex blackish-bronze color, with fulvous pile; a black spot on the cheeks; antennæ yellow ferruginous, arista black; thoracic dorsum and scutellum greenish-bronze color, clothed with erect fulvous pile; pleuræ and pectus black. Abdomen black, shining, clothed with black pile; a [small] tuft of yellow pile on each side at the base. Halteres yellow. Coxæ and about two-thirds of the femora black; the end of the latter, the tibiæ, except a black ring in the middle of each, and the three basal joints of the tarsi are of a saturate yellow; the last two tarsal joints black. The proximal two-thirds of the wings are tinged with yellowish, the remainder is gray; the latter color extends along the posterior margin as far as the axillary incision; within the yellow portion there is a hyaline spot in the angle between the first and second veins (at the proximal end of the marginal cell); the veins near the root of the wings are all tinged with yellow.

"A single female specimen."—O. Sacken.

Description compared with the type specimen at Cambridge.

Criorhina (Cynorhina) nigra, n. sp.

Habitat.—New Hampshire!

♀. Length, 7^{mm}. Lower part of the front, antennæ, and face, reddish yellow; front above, black; cheeks shining, black; dorsum of thorax black, shining, with a bronze reflection; pile short and not abundant, yellow. Abdomen wholly black, shining, nearly bare; pile on the sides in front rather abundant and long, light yellow. Legs black; knees, tip of tibiæ and of tarsal joints, luteous. Wings lightly infuscated; base yellow.

One specimen, White Mountains (National Museum, Professor Riley's collection). This species is closely allied, evidently, with *C. armillata*; but will be readily distinguished by the black legs.

Criorhina (Cynorhina) analis. (Plate IX, fig. 3.)

Milesia analis Macquart, Dipt. Exot., ii, 2, 79; tab. 15, fig. 2.

Criorhina analis Osten Sacken, Cat. Dipt., 136; Williston, Proc. Am. Phil. Soc., xx, 330.

Habitat.—Eastern States!

♂, ♀. Length, 9 to 12^{mm}. Face light reddish yellow, the sides lightly dusted with white, nearly perpendicular below the prominent antennal process, gently convex on the middle; cheeks black, or with a blackish stripe. Antennæ of the same color as the face, the first two joints with short black pile above, third joint large, rounded. Front in female nearly of the same color, shining below, dusted and with short yellowish pile above; on the vertex or upper third blackish; frontal triangle shining, of the same color as face. Occiput black, dusted with white near the orbits. Eyes of male contiguous for a short distance. Thorax shining, greenish black, with moderately abundant light-colored pile; humeri and pleuræ dusted with whitish and with more whitish pile. Abdomen bluish black, shining, with short black pile, on the sides of the second segment, longer, whitish; the black encroaches more or less on the fourth segment, usually forming a more or less triangular dilatation; remainder of the abdomen conspicuously orange-yellow, with the same colored pile. Legs chiefly black, with black and light yellow pile; tip of femora, the base and end of the front and middle tibiæ, and the narrow base and abrupt end of hind tibiæ, and all the tarsi, except the last two joints, light yellow; the front and middle tibiæ more brownish in the middle. Wings hyaline, a little yellowish in front.

Numerous specimens.

Criorhina (Cynorhina) humeralis. (Plate IX, figs. 4, 4*a*.)

Criorhina humeralis Williston, Proc. Am. Phil. Soc., xx, 330.

Habitat.—Washington Territory, California!

♂, ♀. Length, 10 to 11^{mm}. Face light yellow, with whitish dust on the sides, shining in the middle; cheeks blackish. Antennæ more reddish yellow, third joint orbicular. Frontal triangle, and the front in female on the lower part, colored like the face, upper half of front black; pile yellowish, short. Thorax shining black, pile yellowish; humeri and a spot on the upper part of meso pleuræ, opaque yellow. Margin of scutellum yellow. Abdomen black, second segment on the sides with a large triangular yellow spot; in the female the third and fourth segments on the sides in front with a rectangular spot, broadly separated, and the fifth segment yellow, except the black tip, which is prolonged narrowly to the front in the middle; in the single male specimen the yellow spots on the third segment are smaller, and the fourth and fifth segments are wholly black. Legs yellow, front and middle femora at the base, a ring before the tip of hind femora, and likewise of the hind tibiæ, brownish black; posterior metatarsi infuscate, last three joints of all the tarsi black. Wings hyaline, somewhat clouded on the outer part, the veins at the base and in front yellow.

Two specimens. An additional female in the M. C. Z. (Loew's collection) from California.

This may be the same species as the following:

Criorhina (Cynorhina) notata.

Milesia notata Wiedemann, Auss. Zw. Ins., ii, 109, 7; Macquart, Dipt. Exot., ii, 2, 80, 2; tab. xv, fig. 5.

Syrphus profusus Walker, List, etc., iii, 578.

Habitat.—Savannah (Wied.).

Ænea, abdomine nigro, maculis duabus, scutelli apice, geniculisque ferrugineis. Rückenschild erzfarben; Hinterleib schwarz, zwei Flecken, Spitze des Schildchens und Kniee rostgelb.—Lange 5½ Linien, ♂.

Antennæ blackish-brown, hind border of third joint ferruginous yellow. Face yellow, like half bleached wax, in some reflections nearly brassy-yellow shining; lowest part of front, on which the antennæ are situated, similar. Thorax yellowish-metallic with yellow pile, base of scutellum blackish, tip yellow. Pleuræ blackish, with a broad yellowish metallic stripe covered with yellow pile. Abdomen black with yellowish pile; base of second and third segments on each side with a small ferruginous spot, on the second the inner end crescentric, on the third the spot is shorter, nearly quadrate. Wings nearly hyaline, the costa strongly yellowish, towards the end a little brownish, the basal veins, the stigma and the halteres yellowish. Legs pitchy-blackish brown, base and tip of the femora ferruginous yellow, tibiæ the same, in some reflections a little whitish; hind tibiæ in the middle broadly brown; anterior tarsi ferruginous yellow with brown tip, hind ones nearly wholly brown.—Translation from Wiedemann, l. c.

This species must be very similar to the preceding; it *may* be the same, but comparison is needed with Eastern specimens before suppressing *humeralis*. See *Criorhina pictipes*, Appendix.

Criorhina (Cynorhina) scitula.

Criorhina scitula Williston, Proc. Am. Phil. Soc., xx, 331.

Habitat.—Washington Territory!

♂, ♀. Length, 10 to 13^{mm}. Face yellow, with whitish dust on the sides, considerably concave below the antennæ in the male, in the female less so; produced downwards. Front in female black on upper part, with short blackish pile, below like the face; frontal triangle in male yellow, eyes rather more contiguous than in *analis*, the frontal process rather less projecting. Antennæ yellowish brown, or blackish brown, the second joint sometimes yellow with black above, the third joint always of a lighter color below. Thorax shining greenish-black; dorsum with blackish pile across the middle, in front and on the scutellum, yellow; humeri yellow with a small confluent spot below, meso-pleuræ yellowish gray pollinose and pilose. Scutellum black, the edge sometimes narrowly luteous. Abdomen black; second segment opaque, with two large yellow spots, narrowly separated, rounded on their inner ends and narrowed toward the margin; third segment with a yellow cross-band on the anterior part, doubly convex behind (the greatest convexity being toward the middle), with a sharp, median angular incision behind, and attenuated nearly to a point on the sides of the abdomen; fourth segment similar in female, in male wholly black, or with a triangular spot in front and reddish behind; hypopygium reddish or yellow; fifth segment in female yellow in front; black at tip. Front coxæ white pollinose in front; all the femora black, except the tip; front and middle tibiæ and metatarsi yellow or reddish yellow; hind tibiæ yellow at the base and tip, a broad ring in their middle, and the hind tarsi, blackish brown. Wings yellowish hyaline.

Four specimens.

SOMULA.*

Criorhina (Somula) decora. (Plate X, figs. 3, 3*a*, 3*b*.)

> *Somula decora* Macquart, Dipt. Exot., 2e Suppl., 57, 1; tab. ii, fig. 11; Osten Sacken, Cat. Dipt., 138.

Habitat.—Eastern and Middle States!

♂, ♀. Length, 14 to 16mm. Antennal process conical, very prominent. Antennæ brownish-black. Face below the antennal process very slightly concave, descending perpendicularly considerably below the eyes; gently convex, light yellow, shining, except near the eyes a small spot is whitish dusted. Cheeks shining black. Front in the female black on the upper part; below in both sexes the upper part of the antennal process is black, the yellow of the face extends up on each side, cutting off the black of the upper portion from that below; pile of the front and the upper part of the occiput black, on the narrow orbits below light yellow. Thorax deeply shining metallic greenish-black, with short, sparse, and obscurely yellowish and black pile; humeri opaque yellow, with yellow pile, meso-pleuræ with a large oval yellow spot and abundant yellow pile. Scutellum like the thorax. Tegulæ yellow. Abdomen black, with three or four pairs of conspicuous, oblique, large, oval, bright yellow, opaque spots; the first pair on the second segment,

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[*] For the definition of this genus see page 209.

broader towards the middle, concave in front and directed backwards and outwards, but not reaching the sides, the sides of the segment narrowly yellow, with yellow pile, the black opaque, except a posterior metallic cross-band, broadest in the middle; third segment similar, except that the spots are less narrowed outward, and the anterior margin is narrowly shining; fourth segment like the third, except that the yellow spots are broader, shorter, and more oval, the metallic of the front border narrower and confined mostly to the sides; fifth segment in the female with the spots small and nearly rounded. The posterior segments margined with yellow behind and clothed with yellow pile, most abundant on the last segment. Venter black, shining, with narrow yellow hind margins to the segments. Legs light yellow, the immediate base of all the femora (on the hind pair the inner side for nearly a third of their length) and the last three joints of all the tarsi black; the fore and hind tarsi on their first two joints and the tip of the hind tibiæ red. Wings dark brown in front, lighter beyond the cross-vein the posterior part hyaline.

Twelve specimens, Connecticut, Massachusetts, and Pennsylvania.

CRIOPRORA.*

Crioprora Osten Sacken, Cat. Dipt., 251, note 241, 1878.

Large, black species, thickly or long pilose. Head not broader than the thorax. Eyes bare, sub-contiguous. Antennæ situated below the middle of the head in profile, the first two joints a little elongated, the third obliquely oval; arista bare. Face laterally compressed, forming a rounded ridge in the middle, on the upper part sometimes sharply ridged, produced nearly forwards, more or less snout like, gently concave from antennæ to tip, the end notched. Cheeks not broad, the lower border nearly at right angles to the plane of the occiput. Thorax rather short and broad. Abdomen oval. Legs stout, the hind femora more or less thickened, with spines below; in the male the hind coxæ sometimes tuberculate and the femora and the tibiæ bent. Marginal cell of wings open; third longitudinal vein nearly straight; cross-vein beyond the middle of the discal cell and oblique. Type of genus *C. alopex* O. S., North America.

TABLE OF SPECIES.

1.	Dorsum of thorax clothed with thick yellow, or reddish-yellow pile, on the pleuræ black; wings with brownish clouds along the veins	2
	Dorsum of thorax clothed withlong, grayish or yellowish-gray pile, on the pleuræ yellowish-white; abdomen deep bluish-metallic . .	**cyanogaster** **cyanella**
2.	Front in female broad, with yellow pile; hind femora somewhat incrassate,	**alopex**
	Front in female clothed with black pile; hind femora thickened, in male much more so and curved	**femorata**

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* *Κριός*, a ram; *πρῶρα*, front.

Crioprora cyanogaster.

Brachypalpus cyanogaster Loew, Centur., x, 51.
Crioprora cyanogaster Osten Sacken, Cat. Dipt., 136, note 241, p. 251.

Habitat.—Pennsylvania (Loew), Colorado!

♀. Length, 11^{mm}. Black, white pilose. Abdomen violaceous. Black, shining, white pilose. Head of the same color. Antennæ fuscous black, first two joints rather long, third oblique. Dorsum of thorax and scutellum bronze-black. Abdomen rather broad and short lightly violaceous, white pilose, the third segment, except the lateral margins and the fourth segment, except some white pile on the disk, clothed with shorter black pile. Legs wholly black, white pilose; hind femora stout, but not incrassate, near the tip below sub-excised, and provided with rigid black setulæ. Head of the halteres dilutely yellowish, stem fuscous; tegulæ white. Wings cinereous, hyaline, near the tip more saturate cinereous. Tip of costal cell and stigma wholly dilutely infuscate. Veins fuscous-black, the transversal ones slenderly clouded with fuscous.—Translation from original.

♂. Length, 12^{mm}. Head in profile like that of *C. femorata*. Eyes narrowly separated below the ocelli; frontal triangle light yellowish-gray pollinose, except a median shining stripe, the ground-color on each side below luteous. Antennæ yellowish-brown. Dorsum of thorax and scutellum rather thickly clothed with light yellowish gray pile; on the pleuræ of the same color. Abdomen elongate, not broader than the thorax, shining. First segment and base of second bronzy; remainder violaceous. Third and fourth segments wholly black pilose. No opaque black cross-bands. Tarsi dark reddish brown; pile of femora in large part black; hind femora incrassate and arcuate; hind tibiæ dilated and with an obtuse angle on the inner side above.

One specimen, Colorado (Morrison), altitude 8,000 feet. There are some discrepancies from the original description, but I would not consider them more than individual or varietal without comparison of Eastern specimens in both sexes. My male differs very distinctly from that of *C. cyanella*, in the less produced epistoma, more thickened and arcuate hind femora, and, perhaps, also, in the more slender abdomen. The absence of the opaque bands of the abdomen in the male, will at once distinguish them. My female of *C. cyanella* has an opaque band, and as Osten Sacken did not indicate its presence in the female in his original description, drawn from both sexes, I am at a loss whether to consider it a sexual or individual character.

Crioprora cyanella. (Plate X, fig. 6.)

Pocota cyanella Osten Sacken, West. Dipt., 339.
Crioprora cyanella Osten Sacken, Cat. Dipt., 136, note 241, p. 251.

Habitat.—California!

♂, ♀. Length, 8 to 10^{mm}. Face black, shining, much produced snout-like, very conical at tip; on each side of this snout a broad stripe of grayish pollen somewhat conceals the black ground color. Front and vertex black, but little shining in the female and thickly clothed with yellowish-white pile, some of which descends along the side of the face, below the antennæ; the occiput and the posterior and inferior orbits beset with pile of the same color. Antennæ brown, first joint sometimes paler; arista reddish. Thorax metallic greenish-black, rather thickly clothed with long pile, which does not, however, much obscure the ground color; the pile on the dorsum is obscurely yellowish or dull grayish, more yellowish-white on the pleuræ. Halteres brownish. Abdomen dark or cobalt, blue, beset, especially on the sides with long whitish pile, in the middle more or less short and black; in the male the second segment is opaque black, except a triangle on each side and a narrow hind margin, which are shining; the third segment has an arcuated, somewhat narrow, opaque black cross-band, sometimes interrupted in the middle. Legs black; tibiæ sometimes brown; knees of the first two pairs yellowish-brown; legs beset with whitish pile, longer on the femora; hind femora somewhat thickened; hind tibiæ rather stout and somewhat curved, especially on the distal part. Wings subhyaline, grayish.

Two males and one female (O. T. Baron), California. This description is but little amended from the original, also drawn from three specimens. My female, which may be somewhat teneral, has the legs also more reddish, the second segment opaque in front, dilated in the middle behind to a point, the hind femora are a little less thickened, and the hind tibiæ a little less bent. Baron Osten Sacken's specimens were reared from pupæ found in February under the bark of *Quercus agrifolia.*

Crioprora femorata. (Plate X, figs. 5, 5*a*.)

Crioprora femorata Williston, Proc. Am. Phil. Soc., xx, 329.

Habitat.—Oregon, Washington Territory!

♂, ♀. Length, 15 to 16^{mm}. Deep shining black. Front in female somewhat narrowed above, with black pile, a little less shining and coppery-colored above in the male, at least a spot of whitish dust above the antennæ on the side. Eyes in male narrowly separated below the ocelli. Face everywhere shining, bare, only moderately produced and obtuse below. Antennæ reddish-brown; arista yellow. Dorsum of thorax and scutellum shining metallic black, with abundant, moderately long, yellow pile; pleuræ with black pile. Abdomen somewhat elongate in the male, oval in the female, with a brassy reflection, much shining; first segment, except the sides, and the second in front and middle subopaque; pile short, not very abundant, black, longer near the sides; on the sides of the second segment longer and yellow. Knees slightly reddish, pile of legs black, short and sparse on the tibiæ; the front and hind tarsi with golden pubescence; hind femora in the male much thickened and bent, with a row of short spinous tubercles below; hind coxæ obtusely tuberculate below, and the hind tibiæ abruptly angulated; in the female the hind femora and tibiæ not bent, the former swollen, but the tubercles less distinct; the coxæ not at all tuberculate;

in both sexes the femora with a triangular projection below near the tip and a corresponding one on the tibiæ near the base. Wings hyaline, with brownish clouds along the veins, and a dark spot near the tip of the auxiliary vein.

Two specimens (H. K. Morrison). This species must be allied to *Brachypalpus chrysitis* of Europe, and forms a connection with that genus.

Criorhina alopex.

Pocota alopex Osten Sacken, West. Dipt., 338.
Crioprora alopex Osten Sacken, Cat. Dipt., 251, note 241.

Habitat.—California (O. S.).

"♂. Length 10 to 11^{mm}. Antennæ brown, first joint black, arista rufous; head black, shining; front rather broad, beset with yellow pile. Thoracic dorsum beset with dense yellowish rufous pile, which nearly conceals the shining black, sub-metallic ground color; pleuræ black, with black pile; scutellum black, with a purplish reflection and long black pile along the edge; halteres brownish. Abdomen black, shining, beset with black pile and some scattered pale yellow pile toward the tip. Legs black, knees and base of tibiæ of the two anterior pairs pale brownish; hind femora somewhat incrassate and beset with a tuft of yellow hairs above; hind tibiæ rather stout. Wings tinged with reddish-brown anteriorly, especially along the veins, the inside of the cells being paler; posterior portion sub-hyaline, slightly brownish along the veins."—Osten Sacken, l. c.

POCOTA.*

Pocota St., Fargeau and Serville, Encycl. Meth., x, 518, 1825.
Dasymyia Egger, Verh. Z. B. Ges., xiv, 71.
Hadromyia Williston, Can. Ent., xiv, 78.

Large species, thickly pilose; black or metallic black, abdomen without spots or bands. Head somewhat flattened. Eyes bare. Antennæ situated near the middle of the head in profile, short, the third joint obliquely oval. Face short, the oral margin in front not lower than the lower border of the eye, gently or deeply concave from the antennæ to the tip, the tip standing forward as far as the base of the antennæ, obliquely truncate below; the cheeks rather narrow, gently convex below, and nearly at right angles to the occiput. Thorax and scutellum large and broad. Abdomen short, broader than the thorax. Legs stout, the hind femora only slightly thickened, thickly beset on the under side with short bristly hairs. Marginal cell of wing open; third vein nearly straight, anterior cross-vein oblique, beyond middle of discal cell. Type of genus *P. apiformis* (Schrank) Schin.

Our single known species must be nearly allied to *P. apiformis*. The face is apparently a little more deeply concave in profile and the insect is larger.

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* *Πόκος*, sheep wool.

Pocota grandis (Plate, X, figs. 7, 7*a*.)

Hadromyia grandis Williston, Can. Ent., xiv, 79.
Brachypalpus Morrisoni Bigot, Annales Soc. Ent. for 1883, 355.

Habitat.—Washington Territory!

♂. Length, 22 to 23^{mm}, of wings 17^{mm}. Brassy-black, shining. Front black, densely clothed with yellowish-gray pollen, and with short yellow pile, intermixed with black at the vertex. Antennæ brownish-red, blackish toward the base. Face whitish-yellow, thickly covered with whitish pollen; in the middle below the antennæ the ground color is obscurely blackish; cheeks black, shining. Dorsum of thorax in front of the wings, and the pleuræ, densely clothed with short yellow pile. Posterior half of thorax, the scutellum and the first three segments of abdomen with thick, short, black pile; fourth and fifth segments with longer yellow pile. Legs black, with short black pile; knees slightly reddish; front tibiæ in front, the tip of hind tibiæ, and the front and hind tarsi yellowish-red, with short, thick, golden pile; middle tarsi reddish. Wings hyaline, costal and sub-costal cells yellowish.

One specimen.

BRACHYPALPUS.*

Brachypalpus Macquart, Hist. Nat. Dipt., i, 523, 1834.

Dark colored species, the body wholly without yellow markings, moderately or thickly pilose. Head and wings as in *Pocota*, but the abdomen narrower than the thorax, elongate; hind femora somewhat, usually much, thickened and elongate. Type of genus, *B. varus* Panzer, Europe.

TABLE OF SPECIES.

1.—Hind femora with short bristles below; abdomen with brilliant metallic cross-bands (*Calliprobola*).	4
Hind femora not with bristles below; abdomen uniformly black.	2
2.—Legs wholly black.	**Rileyi**
Legs in part yellow.	3
3.—Second and third abdominal segments each with a broad, posterior, opaque cross-band; smaller species.	**parvus**
Abdomen not with such cross-bands; larger species.	**frontosus**
4.—Dorsum of thorax yellow pilose.	**sorosis**
Dorsum chiefly black pilose.	**pulcher**

Brachypalpus frontosus. (Plate X, fig. 8.)

Brachypalpus frontosus Loew, Centur., x, 50.

Habitat.—District of Columbia, Pennsylvania!

♂, ♀. Length, 10 to 12^{mm}. Black, shining, clothed with whitish, or obscurely yellowish-white pile. Eyes of male very briefly contiguous, frontal triangle covered with yellowish-whitish pollen; front in the female broad, with a median white pollinose fascia; obsolete in the middle. Antennæ reddish brown or blackish; first two joints a little elongate,

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βραχύς, short; palpus.

sometimes dark red, third joint obliquely oval; arista yellowish-brownish. Face retreating to nearly as low as the bottom of the eyes, the epistoma produced, in profile deeply concave; broadly shining across the middle, above, for the whole width, and for a short distance below the antennæ, whitish pollinose; below, an oblique stripe runs from the eye to the oral margin in front. Dorsum of thorax and scutellum metallic black, shining, obscured by the pile, the former with four sub-obsolete coppery-purple stripes. Abdomen black, or brownish black, sub-opaque in the male on the posterior part of the second and third segments; pile wholly light colored. Legs black, extreme tip of femora, and narrow base of tibiæ, reddish yellow, the intermediate tibiæ more reddish throughout, except a dark ring; front and middle tarsi reddish on the basal joints; hind femora thickened, much so in the male, and on the outer part below with an angular projection; posterior tibiæ arcuated, more so in the male, and with a tooth-like process on the inner side above, corresponding to the femoral projection, and a stout spur at the lower end, both of which are wanting in the female. Halteres and tegulæ light yellow. Wings nearly hyaline, near the end somewhat infuscated; transverse veins lightly clouded; stigma luteous.

Two male specimens from Pennsylvania (Eugene Keen), and a teneral female bred by Professor Riley.

Brachypalpus Rileyi, n. sp.

Habitat.—North Carolina!

♀. Length, 7^{mm}. Black. Antennæ blackish-brown, third joint transversely oval; arista yellow. Face and posterior orbits gray pollinose; cheeks shining black. Lower part of the front shining; across the middle broadly pollinose; black pilose above. Dorsum of thorax black, sparsely pilose, in the middle with two narrow opaque stripes; on each side a similar, abbreviated, and interrupted one. Abdomen oval, bright shining black, sparsely light pilose; the first segment, the second segment, except a large triangular shining spot on each side, narrowly separated at their tips, and a posterior band on the third segment, opaque black. Legs wholly black, with sparse light pile; hind femora thickened. Wings hyaline, stigma luteous, a narrow brown cloud on base of second vein, anterior cross-vein, and the penultimate section of fifth vein.

One specimen, North Carolina (National Museum, Professor Riley's collection).

Brachypalpus parvus, n. sp.

Habitat.—Colorado!

♂. Length, 7^{mm}. Head as in *B. Rileyi;* the eyes narrowly separated below the ocelli. Dorsum of thorax brassy black, shining, with two narrow opaque stripes, abbreviated behind, and an outer abbreviated stripe on each side, interrupted at the suture. Pile only moderately abundant, light yellow. Abdomen shining metallic bronze black; the second and third segments each with a broad posterior opaque black band, with a slender median anterior extension to the front margin. Pile light yellow, long on the sides. Legs black; knees and basal joints of the tarsi yellow; hind femora much thickened, not arcuate; hind tibiæ arcuate, considerably shorter than the femora. Wings nearly hyaline, with brownish clouds on the middle cross-veins.

One specimen, Colorado (National Museum, Professor Riley's collection).

It is very possible that this is the male of *B. Rileyi*, but the metallic coloring of the body and the color of the legs make it doubtful.

Brachypalpus sorosis, n. sp.

Habitat.—Georgia!

♂. Length, 12^{mm}. Frontal triangle and face yellow. Antennæ yellowish red. Cheeks black. Dorsum of thorax shining metallic bronze, with erect, rather abundant light yellow pile. Humeri yellowish red. Pleuræ black, in the middle with light yellow pile. Scutellum like dorsum of thorax. Abdomen on the dorsum shining metallic bronze, with opaque black cross-bands; first segment black in front, the second segment with a broad band in front, and another, a crescentric one (the broadest) behind; third segment with a slender one on the anterior margin, behind the middle with a narrow anteriorly arcuate one; pile erect, rather abundant, light yellow. Legs, including the trochanters, reddish yellow, with nearly white pile; tip of tarsi blackish. Wings brown in front, subhyaline behind.

One specimen in National Museum (Professor Riley's collection), labelled "S. Georgia, Morrison." The species very strongly resembles *C. pulcher*, but it seems distinct in the pile of the thorax, and the color of the legs and wings.

Brachypalpus pulcher. (Plate X, figs. 9, 9*a*.)

Brachypalpus pulcher Williston, Can. Ent., xiv, 79.
Calliprobola ærea Bigot, Annales Soc. Ent. de France, 1883, p. 352.

Habitat.—Oregon, Washington Territory!

♂, ♀. Length, 12 to 16^{mm}. Face yellow, with black cheeks, and with or without blackish or brown median stripe, shining in the middle, pollinose on the sides. Frontal triangle of the male yellow or brownish; front in female black, rather narrow, a little broader below, yellowish pollinose on the sides; piles short, fuscous. Antennæ yellowish brown or blackish, third joint of a lighter color near the base below. Dorsum of thorax and scutellum black, with a bluish or partly metallic reflection, or, in better preserved specimens, a metallic bronze; humeri and a slender interrupted band on the suture yellowish-whitish pollinose; the pile of the dorsum more blackish, on post-alar callosities, scutellum and pleuræ, yellow. Abdomen of a brilliant golden or bluish-bronze, with short golden pile and opaque black markings as follows: first segment, except the sides, in the female, in the male the hind border also shining;

second segment on the front part, and a band beyond the middle of about the same width, somewhat angulated in front in the middle; third segment similar, except the front border may be quite narrow and the cross-band sub-interrupted; fourth segment in male wholly metallic, concealing the hypopygium, in the female with a very narrow front border and narrow interrupted cross-band; the black bands are attenuated on the sides, not quite reaching the lateral margins. Legs yellow; femora rather stout, the hind pair moderately thickened; front and middle pairs mostly brownish or black, sometimes prevailing yellow, blackish above, hind femora varying from a blackish ring near the base to almost wholly black, below with short black bristly hairs near the end; last three joints of the tarsi black. Wings smoky hyaline, stigma yellowish brown.

Twelve specimens, Mount Hood, Oregon, and Washington Territory (H. K. Morrison, Professor Comstock).

XYLOTA.*

Xylota Meigen, Syst. Beschr. iii, 211, 1822.
Heliophilus Meigen, Illiger's Mag., ii, 273, 1803.
Micraptoma Westwood, Introduction to Class. of Insects, i.

Medium to large sized species, slender, the abdomen more or less red, yellow, or metallic. Head hemispherical. Antennæ situated on a more or less prominent conical projection, first two joints short, the third rather large, oval or round, with a basal, bare arista. Face in profile concave, without tubercle, transversely arched or rarely carinate, oral margin in front projecting, but not extending as far forward as the base of the antennæ. Eyes bare, contiguous in the male; front in female narrowed above. Thorax large; scutellum thinned on its border, of the color of the thoracic dorsum. Abdomen not wider than the thorax, twice or thrice as long, somewhat flattened and usually with nearly parallel sides. Legs stout; the hind femora elongated and more or less thickened, below with a row of short spines, not arcuated; hind coxæ in the male frequently with a spinous tubercle below; hind tibiæ arcuate, often terminating in a spur. Wings when at rest usually folded over each other; marginal cell open, third vein straight or gently curved, anterior cross vein at or beyond the middle of the discal cell, more or less oblique.

TABLE OF SPECIES.

1.—Legs wholly black; hind femora much thickened 2
Legs not wholly black 3
2.—Wholly black; wings black . . . . chalybea
Abdomen chiefly red; the second segment with a basal black triangle; wings nearly hyaline . . . . pigra

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*Ξύλον, wood.

3.—Second and third abdominal segments (at least) red 4
Second and third segments wholly black, or with yellow spots 7
4.—Abdomen wholly red except the first segment; hind coxæ of the male without a tooth below . . . . **bicolor**
Abdomen except the first segment, not wholly red 5
5.—Second abdominal segment with a basal black triangle; the 2-4 segments with narrow lateral black margins . . . . **marginalis**
Abdomen not so marked 6
6.—Hind coxæ of male with a spur below . . . . **flavitibia**
Hind coxæ of male without a spur below . . . . **notha**
7.—Front and middle legs and a large part of the hind femora yellow; large species 8
Front legs in large part black 9
8.—Coxæ black . . . . **curvipes**
Coxæ yellow . . . . **vecors**
9.—Abdomen long, slender, with two yellow spots on the second segment . . . . **angustiventris**
Abdomen not unusually slender 10
10.—Abdomen with two pairs of yellow spots 12
Abdomen wholly black 11
11.—Third joint of antennæ but little longer than broad . . **Anthreas, obscura**
Third joint large, much longer than broad . . . . **elongata**
12.—Hind femora much thickened, smaller species 13
Hind femora moderately thickened 14
13.—Arista wholly black . . . . **nemorum**
Arista yellow at the base . . . . **fraudulosa**
14.—Fourth abdominal segment brilliant bronze; third longitudinal vein gently curved . . . . **analis**
Fourth abdominal segment black; third vein quite straight . . . **ejuncida**

For other species, see descriptions.

Xylota (?) tuberans, n. sp. is Myiolepta nigra
Habitat.—Texas !

♂. Length, 9 to 10mm. Shining black. Face thickly gray pollinose, except on the tubercle; occiput and posterior orbits densely pollinose. Third joint of antennæ not large, orbicular; thorax shining, thinly and short yellowish and black pilose. Abdomen wholly shining black, nearly bare. Legs black, all the tarsi, except the last two joints, yellowish white. Hind femora thickened and elongate, not arcuate. Coxæ without spurs. Wings nearly hyaline toward the base, infuscated on outer part. Stigma luteous.

One specimen, Texas, National Museum.

The present species cannot properly be placed in this genus. The neuration is the same, except that the cross-vein is not at all oblique. The head in general structure is the same, but the face is very distinctly tuberculate. In profile it is strongly concave below the antennæ, then forms a small but prominent tubercle opposite the lower border of the eyes, and the face is more produced than in Xylota. The cheeks are broader and form an obtuse angle with the plane of the occiput. The abdomen is elongate, but is much stouter and broader than in most

Xylotæ. It is as broad as the thorax, the second and third segments nearly parallel on the sides.

I suspect that the female abdomen may be broader, and the face without a tubercle; if so there is evidently a relationship with *Myiolepta*.

Xylota marginalis, n. sp.

? *Xylota Libo* Walker, List, etc., iii, 556.

Habitat.—White Mountains!

♀. Length, 10^{mm}. Front broad, only gently narrowed above, shining black, pollinose on each side, broadly nearly the middle; pile white, somewhat dusky near the vertex. Antennæ yellowish red, the arista wholly yellow; the first joint black, third joint rounded, a little longer than broad. Face shining black, lightly whitish dusted on each side below the antennæ. Dorsum of thorax shining bronze black, with very short, obscure whitish pile; in the middle with two slender darker stripes separated by a linear space. Pleuræ shining black; tegulæ white; halteres very light yellow. Abdomen bright red; first segment, except the hind angles, a slender triangle at the base of the second, extending to beyond the middle, and the narrow lateral margins of the second, third, fourth, and fifth segments, deep shining black; the short pile wholly white. All the femora except their immediate tip, and the broad distal end of the hind tibiæ, black; front and middle tibiæ yellow, with the distal ends brown, and a less distinct brownish ring before the middle; hind tibiæ, except the distal part, red, with a brown ring on basal third; first three joints of all the tarsi light yellow, the terminal joints blackish; hind femora much thickened, hind coxæ without spurs, hind tibiæ with a terminal spur. Wings nearly hyaline, distinctly tinged with yellowish along the veins, stigma opaque yellow; the base of the marginal cell, the anterior cross-vein, and the cross-veins at base of discal and fourth posterior cells, conspicuously clouded with brown.

One specimen, near Mount Washington, August 1. This agrees tolerably well with Walker's description of *X. libo*, except that the antennæ are not "black with the first joint ferruginous" and his description of the abdomen will not apply, viz, "dark red, slightly pitchy on the sides and hind borders of the segments."

Xylota analis, n. sp.

Habitat.—California, New Mexico!

♂, ♀. Length, 11 to 12^{mm}. Front of female considerably narrowed above, shining black, toward the vertex metallic, across the middle broadly yellowish gray pollinose and similarly pilose. Antennæ black, the third joint brown, with more or less reddish, rounded, not longer than broad, arista wholly luteous. Face black, moderately thickly white pollinose below the antennæ; frontal triangle thickly white pollinose except a lunate spot above the antennæ. Dorsum of thorax bronze black, more metallic in front, a sericeous spot to the inner side of each humerus; pile very short, in front yellow, across the middle blackish. Abdomen: first segment bronze black, shining; fourth segment and the following very brilliant golden bronze; second segment opaque black, on each side with a large triangle shining yellow, its outer border bronze; third segment similar, but the black not as extensive on the front margin and the yellow not filling out the whole of the triangle, which is elsewhere shining bronze like the fourth segment; pile yellow, except on the opaque black portions, where it is black. Legs black; the immediate tip of all the femora, the base of all the tibiæ, and the rather broad tip of the front and middle tibiæ, the narrow tip of the hind tibiæ, and the first two joints of all the tarsi, reddish yellow; hind femora moderately thickened, hind coxæ with a slender sharp spur in the male, hind tibiæ without a spur at the tip; pile of legs white. Wings nearly hyaline, stigma brownish; third longitudinal vein beyond the cross-vein gently but distinctly curved backward.

One male, California (Baron), and two females, New Mexico (Gaumer).

Xylota pigra. (Plate XI, figs. 7, 7*a*.)

Syrphus piger Fabricius, Syst. Entom., iv, 295, 63, 1794.

Milesia pigra Fabricius, Syst. Antl., 192, 16; Fallen, Syrph., ii, 7 var. B; Latreille, Gen. Crust., iv, 331.

Xylota pigra Meigen, Syst. Beschr., iii, 221, 14; Zetterstedt, Dipt. Scand., ii, 878, 12; viii, 3192; Loew, Amer. Jour. Sci., xxxvii, 317.

Milesia hæmatodes Fabricius, Syst. Antl., 193, 21.

Xylota hæmatodes Say, Amer. Ent., i, pl. viii; Compl. Wr., i, 16; Wiedemann, Auss. Zw. Ins., ii, 99, 3; Macquart, Dipt. Exot., ii, 2, 73; pl. xiii, fig. 4.

Xylota crassipes Wahlberg, Acta Holm., 1838, 15, 7.

? *Xylota rubbiginigaster* Bigot, Ann. Soc. Ent. Fr., 1884, 543 (Teneral ?).

Habitat.—Atlantic and Pacific States, Europe!

♂, ♀. Length, 11 to 12^{mm}. Antennal process prominent, below the antennæ receding to beyond the middle, then directed downward and forward. Face black, thinly clothed with whitish pollen, shining on the cheeks. On the frontal triangle, except just above the antennæ, pollinose. Front in female shining, a narrow, lightly pollinose band across the middle. Antennæ black, third joint brownish black. Thorax black, but little shining, finely roughened, with a purplish or bronze reflection, nearly bare, the pile very short, black, more or less white in front; on the inner side of the humeri a large pollinose spot. Abdomen dark shining red, in the male usually more orange-colored, on the posterior segments frequently brownish or brown, the hypopygium piceous; first segment, except the small hind angles, shining black; the second with a black triangle in front, its tip reaching to or beyond the middle of the segment. Legs black, sometimes more brownish; tarsi and knees a little lighter colored; hind femora much thickened, in the male a little more so than in the female, and with short spinous bristles the whole length below, longer on outer part; hind coxæ of the male rounded below, without spur or protuberance; hind tibiæ in both sexes with a spur at tip. Wings nearly hyaline behind, in front and outer part more or less blackish or brownish; stigma darker.

Two specimens from Connecticut, one from Georgia, and twenty-five from California, Washington Territory, Oregon, and Colorado. A single specimen from Professor Riley's collection labeled "Hundreds found under pine bark in damp situation," which agrees with observations made by Perris (Hist. des Insects du Pin maritime, Ann. Soc. Ent. France, 4, x, 326–330, pl. 4, figs. 112–124) on European specimens.

Xylota flavitibia. (Plate XI, fig. 6.)

Xylota, sp. nov., Williston, Proc. Am. Phil. Soc., xx, 1882, 327.
Xylota flavitibia Bigot, Annales Soc. Ent. Fr., 1884, 546.

Habitat.—Colorado!

♂. Length, 12^{mm}. Face short, moderately receding and concave, black, rather thickly covered with white pollen. Antennal process rather prominent. Antennæ black, the third joint brownish or reddish black. Frontal triangle wholly thickly white pollinose. Cheeks narrow, convex below. Thorax metallic black, shining, a sericeous spot on the inner side of each humerus, thickly clothed with short whitish pile. Abdomen dark shining red, brownish or blackish towards the end; first segment, except the small hind angles, and hypopygium shining greenish-black; second segment wholly red. Legs black; all the tarsi, except the last two joints, reddish yellow; tibiæ reddish yellow, the front and middle pairs with a broad brownish, the hind pair with a broad blackish ring, beyond the middle. Hind femora considerably thickened, but less so than in *X. pigra;* the hind coxæ of male with a slender sharp spur below. Wings nearly hyaline, but distinctly tinged with brownish on the outer part; stigma brown.

♀. The lower part of the front is pollinose, the second, third, and fourth segments of the abdomen wholly red; otherwise as in the male.

Two ♂ and two ♀ specimens.

Xylota notha, n. sp.

Habitat.—Colorado!

♂. Length, 11^{mm}. Face and frontal triangle covered with gray pollen, the ground color wholly black. Antennæ, with the arista, black. Dorsum of thorax shining metallic bronze green black, a sericeous spot on the inner side of each humerus; pile very short, light colored, on the pleuræ longer and white. Scutellum like the thoracic dorsum. First segment of abdomen shining greenish black, fourth and hypopygium deep shining greenish black; second and third segments light red with a very faint, slightly brownish median stripe; second segment with a narrow black cross-band in front, dilated in the middle into a small triangle, not reaching to the middle of the segment, opaque black; the hind border of the second segment narrowly and faintly brownish, the angles behind blackish; hind border of the third more distinctly brown, the posterior angles more broadly brownish. Legs black; base of all the tibiæ, and tip of the front and middle pairs, and first three joints of the front and middle tarsi, light yellow; hind tarsi at the base, and the tibiæ in the middle, more brownish; hind femora moderately thickened, hind coxæ without tubercle below. Wings nearly hyaline, stigma brown.

One specimen.

Xylota bicolor.

Xylota bicolor Loew, Centur., v, 39.

Habitat.—Pennsylvania!

♂. Length, 13^{mm}. Face and front black, thickly grayish yellowish dusted, except on the cheeks, which are bare and shining. Antennæ black, third joint large, somewhat reddish below near the base. Dorsum of thorax shining bronze black, clothed with light yellow, rather long pile; pleuræ shining black, with whitish pile. Abdomen: first segment shining black with whitish pile, its posterior angles narrowly and the remainder of the abdomen, including the hypopygium, bright orange red with golden pile. Legs black, white pilose; the base of front and middle tibiæ and the first two joints of the front and middle tarsi light yellow or white; hind coxæ rounded, not tuberculate, hind femora considerably thickened, wings hyaline; stigma luteous.

Two specimens, from Mr. Eugene Keen.

Xylota ejuncida. (Plate XI, figs. 8, 8*a*.)

Xylota ejuncida Say, Amer. Ent., i, pl. viii; Compl. Wr., i, 15; Wiedemann, Auss. Zw. Ins., ii, 100, 5.
Xylota Baton Walker, List, etc., iii, 554.
? *Xylota quadrimaculata* Loew, Centur., vi, 56.
Xylota annulifera Bigot, Annales Soc. Ent. Fr., 1884, 545.

Habitat.—Over the whole United States.

♂, ♀. Length, 9 to 10^{mm}. Face much receding to considerably below the middle; black, rather thickly clothed with gray pollen. First two joints of antennæ black, third red or brownish red, oval, longer than broad, the arista wholly black. Frontal triangle thickly covered with grayish-yellowish pollen; front of female narrow above, bright shining black, except a narrow pollinose cross-band below the middle. Dorsum of thorax shining metallic green or greenish black, a sericeous spot at the inner side of each humerus; pile of scutellum short, yellow; on the mesopleuræ longer, white. Abdomen: first, fourth, and following segments shining greenish black; second and third opaque black, with a broad, yellow, shining, short yellowish pilose, interrupted cross-band; elsewhere the pile of the abdomen is short and black, except a white spot on each side of the fourth segment; in the male the yellow spots are somewhat smaller, and sometimes partly obscured. Legs black, base of all the tibiæ and the first two, or more usually the first three, joints of the front and middle tarsi light yellow; the front and middle tibiæ, except their base, and the hind tarsi, brownish, the second joint of the hind tarsi more yellowish; hind femora moderately thickened, less so in the female; hind coxæ of the male with a small, sharp spur below.

Wings nearly hyaline, only faintly tinged with brownish on the outer part.

In all the eastern specimens that I have examined the pile of the thoracic dorsum is light colored; some of the western specimens are quite the same, but the larger proportion of those from the Pacific Coast have black pile. In all I have examined about fifty specimens from Maine, New Hampshire, Massachusetts, Connecticut, New York, Pennsylvania, Canada, Georgia, Florida, Kansas, Colorado, Arizona, California, Washington Territory, and Oregon.

Xylota subfasciata.

Xylota subfasciata Loew, Centur., vi, 57.

Habitat.—Red River of the North (Lw.).

♂, ♀. Length, 8 to 9^{mm}. Obscurely bronze green; second and third segment of the abdomen luteous, with a slender stripe and a posterior cross-band (that on the second narrow, on the third broad) black, lateral margins blackish bronze; antennæ wholly black, the arista of the same color; legs black; base of the front and middle tibiæ and the first two joints of their tarsi luteous; tip of the hind tibia not produced into a tooth, the angle below, however, rather acute, hind coxæ of the male dentate.

Similar to *X. quadrimaculata* [*X. ejuncida*], but the antennæ are wholly black, the luteous spots of the abdomen are larger and the black stripe separating them more slender; the tibiæ are more obscurely colored, and the hind pair have a less acute spur at the tip. The spots of the female abdomen are less luteous, sometimes in part, rarely wholly, metallic. Loew, l. c., translation.

Xylota fraudulosa.

Xylota fraudulosa Loew, Centur., v, 41.

Habitat.—New York, New Hampshire, Washington Territory!, Illinois, Wisconsin (O. S.).

♂, ♀. Length, 7^{mm}. Front of female somewhat metallic green; frontal triangle and the face covered with gray pollen. Antennæ reddish brownish, the first two joints blackish, the arista black, but reddish at the base. Thorax shining, somewhat metallic green, with four faintly coppery dorsal stripes. Abdomen: the first segment, the fourth and following, shining metallic; in the male the second and third mostly opaque black, each with two large quadrate yellow spots contiguous with the lateral margins; in the female smaller and separated from the margins. Legs black, somewhat greenish; knees, base of front and middle tibiæ, first two or three joints of the front and middle tarsi light yellow; the intermediate joints of the hind tarsi more brown; hind femora strongly thickened; the hind coxæ without tubercle below. Wings faintly tinged with blackish.

This species is very similar to *X. ejuncida.* The arista, however, is reddish at the base, the abdominal spots are more quadrate in shape, and more yellow; the legs are blacker, and the hind femora much more swollen, and the coxæ without tubercle. According to Loew (l. c.) "it is similar to *X. bifasciata* Meig. [*X. nemorum*] of Europe, but is a little smaller, the pile shorter, and the arista of the antennæ is not wholly black, but luteous at the base."

Xylota nemorum.

Milesia nemorum Fabricius, Syst. Antl., 192, 17.
Milesia iguava Fallen, Syrph., 11, 6.
Xylota nemorum Meigen, Syst. Beschr., iii, 219, 11; Macquart, Hist. Nat. Dipt., i, 521, 3; Zetterstedt, Ins. Lapp., 585, 3; Dipt. Scand., ii, 871, 3; Schiner, Fauna Austr., i, 356; v. d. Wulp, Tijdschr. voor. Ent. xxvi, Amerik. Dipt., 3, 8, 45.
Xylota bifasciata Meigen, Syst. Beschr., iii, 219, 10.
Xylota nigripes Zetterstedt, Ins. Lapp., 585, 4; Dipt. Scand., ii, 880, 14.

Habitat.—Europe (auct.), Canada (v. d. Wulp).

This species is given on the authority of Mr. v. d. Wulp (l. c.), who in a letter to the writer says, "*X. nemorum* F. differs from *X. fraudulosa* Loew not only in the size, the longer pile, and the arista not being yellow at the base, but also in totally lacking the cupreous stripes of the thorax, which are present in *X. fraudulosa.* I believe the species are distinct." Length, 8.5^{mm}.

Xylota angustiventris. (Plate XI, fig. 9.)

Xylota angustiventris Loew, Centur., vi, 58.

Habitat.—Illinois (O. S.), New York, Pennsylvania!

♂, ♀. Length, 10 to 11^{mm}. Frontal process very prominent, the face much receding, thickly covered with white pollen. The frontal triangle pollinose like the face, except a bare shining spot above the base of the antennæ. Antennæ brownish black, the third joint large, oblong ovate; the arista black. Thorax shining, somewhat metallic greenish or bluish black; a sericeous spot on the inner side of each humerus; pile of mesopleuræ white. Abdomen long and slender, shining metallic blackish green or blue; the second segment with a slender median stripe and posterior part, dilated in the middle, and the posterior half of the third segment, opaque black; second segment with two oblong, narrowly separated, yellow or luteous spots in the male; in the female wanting. Legs black; base of all the tibiæ, tip of front and middle tibiæ, first three joints of front and middle tarsi, and second and third joints of hind tarsi, whitish yellow; hind metatarsi brown or blackish; hind femora moderately swollen; hind coxæ in the male with a tubercle below; hind tibiæ not produced into a spur at tip, but obtuse. Wings, except the basal third, slightly infuscated, anterior cross-vein very oblique.

Two males (Auxer, Keen), and a female of which the head is wanting.

Xylota curvipes.

Xylota curvipes Loew, Neue Beitr., ii, 19; Osten Sacken, Bull. Buf. Soc. Nat. Sci., iii, 70; Cat. Dipt., 252.

?*Xylota satanica* Bigot, Annales Soc. Ent. Fr., 1884, p. 546.

Habitat.—New Hampshire, New York, Minnesota, California.!

♂, ♀. Length, 15 to 16mm. Head black with a greenish reflection; the sides of the front and face with white pollen. Antennæ brownish red, the arista brown. Thorax above of a shining black color, with very indistinct stripes and sparse yellow and black pile; a faint pollinose spot on the inner side of the humeri; pleuræ black, with yellow and black pile. Abdomen elongated, shining blue-black. Legs reddish yellow (not including the coxæ, except a reddish spot on the hind trochanters behind), the hind femora on the distal fourth, the hind tibiæ and tarsi wholly, black; hind femora much swollen and their tibiæ much curved and terminating in an obtuse spur; pile of the femora long and yellow and on the inner side of the hind tibiæ thick and black; in the female the pile of the legs less abundant and shorter. Wings distinctly tinged with brown on the distal half; stigma dark brown.

A single male taken near the base of Mount Washington, August 1; a female from the same State (F. H. Fall); another from New York (Professor Lintner); and others from Minnesota (E. Keen, July) and California. Comparison is yet needed of American and European specimens to determine the identity of ours with *X. curvipes* Loew.

Bigot in his description of *X. satanica* does not mention the black on the tip of the hind femora, otherwise his description shows no important differences.

Xylota vecors.

Xylota vecors Osten Sacken, Bull. Buff. Soc. Nat. Sci., iii, 69; Cat. Dipt., 252.

Habitat.—White Mountains, New Hampshire (O. S.)!

"♂, ♀. Thorax brownish bronze color, abdomen black; legs, including the coxæ, ferruginous; end of hind femora, the hind tibiæ and tarsi black. Length, 13 to 14mm.

"Face and cheeks black, with a greenish reflection and a delicate whitish down on the sides. Antennæ reddish brown; front black, with some black, erect hairs. Thorax brownish bronze color, with indistinct longitudinal greenish stripes; pubescence sparse, short, erect, brownish yellow, mixed with black; a whitish sericeous spot inside of the humeri; pleuræ greenish black, with blackish hairs. Scutellum greenish bronze color. Abdomen black, with a bluish or purplish reflection and scattered whitish and black hairs. Knob of halteres black, stem reddish. Legs ferruginous, including the coxæ; the tip of ungues brown; the distal third of the hind femora, the hind tibiæ, and hind tarsi black. Wings tinged with brownish, proximal half more hyaline; stigma dark brown.

"Three males and two females.

"In general appearance this species is very like the European *X. femo-*

rata, but it differs especially in the color of the coxæ, which in the latter are black. Minor differences are that in *X. femorata* the wings are more uniformly colored, less tinged with brown on the distal half, the stigma paler, etc."

Original description, compared with the type specimen in the Museum of Comparative Zoology at Cambridge.

Xylota chalybea.

Xylota chalybea Wiedemann, Auss. Zwei. Ins., ii, 98.

Habitat.—Pennsylvania, Virginia! Illinois (O. S.).

♂. Length, 12^{mm}. Head and antennæ black, the face lightly dusted on the sides. Dorsum of thorax violet steel-black, with short black pile; inner sides of the humeri with a distinct silvery spot; pleuræ black. Abdomen steely blue black, with white pile on the sides in front. Legs wholly black, with black pile; hind femora much thickened, hind tibiæ arcuated and terminating in a spur; hind coxæ without tubercle below. Wings blackish brown, less intense behind.

Two specimens. The species will be easily recognized by the entire absence of yellow in its color, by the dark wings, etc.

Xylota obscura.

Xylota obscura Loew, Centur., vi, 55.

Habitat.—Red River of the North (Lw.), Oregon, California!

♀. Length, 10^{mm}. Head black, front considerably prominent, and the face moderately excavated. Antennæ rather large, first two joints black fuscous, third reddish-ferruginous, rounded, arista wholly black. Thorax obscurely bronze-green, no white pollinose spot near the humeri. Scutellum of the same color. Abdomen rather broad; first segment black, shining; second segment, except two large, subtriangular, shining bronze, whitish pilose spots, black, black pilose, and sub-opaque; third segment with similar spots coalescing into a fascia; fourth segment wholly shining metallic, the posterior margin rather more blackish; fifth segment shining black. Venter wholly scoriaceous black. Legs black, hind femora slightly thickened, base of all the tibiæ dilutely lutescent, the tip of the hind tibiæ not produced into a tooth, first two joints of the four front tarsi reddish-ferruginous, or reddish fuscous, hind tarsi wholly black, below pallidly tomentose. Wings sub-hyaline, stigma fuscous, anterior cross-vein long and much oblique.—Translation.

Xylota barbata.

Xylota barbata Loew, Centur., v, 40.

Habitat.—Sitka (Lw.).

♀. Length, 10^{mm}. Head broad, black. Front moderately projecting, black pilose. First two joints of the antennæ black, third blackish-brown, sub-rotund; arista black. Face moderately excavated, white pollinose. Pile on the posterior orbits below white, rather longer than usual in Xylotæ. Dorsum of thorax obscurely coppery metallic, moderately shining, white pilose. Abdomen rather broad, blue black, subopaque, clothed with very short black pile; first segment wholly steel blue, shining, white pilose; second segment with a steel-blue, very broad, shining, sub-entire fascia, clothed with white pile; the two following segments near the anterior margin with a similar fascia, but interrupted and less broad. Legs black, white pilose, femora at the tip with short black pile, the hind femora not incrassate; front tibiæ reddish brown; middle and hind tibiæ at the base, and the first two joints of the front tarsi, brownish red. Wings cinereous, basal half hyaline, stigma blackish, veins black.

♂. The abdomen somewhat narrower, the metallic bands of the second and third segments somewhat luteous, the hind femora a little thickened, the hind coxæ unarmed.

One female from Oregon, another from Washington Territory, and a male from California. The color of the thoracic dorsum in these females is a cobalt blue with a distinct coppery reflection; in the male the coppery luster is almost wholly wanting. The metallic blue cross-band of the fourth segment of the abdomen in my specimens does not appear to be interrupted, but entire. The usual narrow pollinose band on the front of the female and the sericeous spots on the inner side of the humeri are present.

Xylota elongata, n. sp.

Habitat.—New Hampshire, Pennsylvania!, Missouri?

♀. Length, 10 to 11^{mm}. Front, narrow above, shining black, pollinose across the middle. Face black, thickly whitish pollinose, narrowly shining on the cheeks. Antennæ black, third joint large, black, elliptical, arista wholly black. Dorsum of thorax shining, somewhat metallic greenish black, obsoletely coppery striped; humeri sericeous. Pleuræ shining black, white pilose. Abdomen elongate, narrow, shining bluish metallic black; second segment with a spot in the middle in front and the posterior part, and the third segment, except a large triangular spot on in each side in front, subopaque; fourth segment, except on the posterior part, and the fifth wholly, shining black; the pile on the metallic portions is nearly white. Femora, except the immediate tip and the last two joints of all the tarsi, black; four front tibiæ, except a broad preapical blackish ring and the three basal joints of the four front tarsi, very light yellow; hind tibiæ at base light yellow, beyond black; three basal joints of hind tarsi brown, with yellow tips. Wings hyaline, stigma, and the remainder of subcostal cell brown.

Three specimens, White Mountains, August 1, Missouri (Theo. Pergande), and Pennsylvania (E. L. Keen). The color of the legs prevents the identification of this species with Bigot's *X. metallifera*. *Xylota flavifrons* Walker (List, etc., 557), may possibly be this species, but the antennæ are not dark ferruginous. The length of the abdomen, as Walker describes it, "abdomen linear, a little narrower than the chest, and fully twice as long," applies better to this than to the allied species.

Xylota Anthreas.

Xylota Anthreas Walker, List, etc., iii, 556.

Habitat.—New Jersey (Walker), New Hampshire!

♀. Length, 9^{mm}. Front narrow above, shining black, whitish pollinose in the middle and on the sides below. Antennæ black, third joint subquadrate, reddish brown; arista luteous at the base. Face black, whitish polinose, except on the cheeks. Thorax shining black, somewhat metallic; pile short, appressed, light colored; humeri sericeous pollinose; pleuræ black, shining, lightly pollinose. Abdomen black, but little shining; first and fourth segments shining; second, third and fourth segments each with a large, subtriangular, shining metallic, white pilose spot on each side, those of the third narrowly separated, those on the fourth confluent. Legs black, white pilose; the immediate tip of the femora, and the base of all the tibiæ, the tips of the four front tibiæ, and the first three joints of their tarsi, yellow; the tip of the hind tibiæ, and the basal joints of their tarsi, fuscous yellow. Wings nearly hyaline; stigma luteous.

One specimen, New Hampshire. Differs from *X. elongata* in the shape and color of the third joint of the antennæ, and in the less elongate abdomen; from *X. obscura* in the front of the female being narrower above, the four front tarsi lighter yellow on the basal joints, and in the base of the arista being luteous.

Xylota metallica.

Xylota metallica Wiedemann, Auss. Zw. Ins., ii, 102.

Habitat.—Georgia (Wied).

Thorace æneo, abdomine nigro; maculis quatuor magnis quadratis luteis. Mit erzgrünem Rückenschilde und schwarzem Hinterleibe, mit vier grossen viereckigen gelben Flecken.—3¾ Linien.

Fühler ocherbraun. Untergesicht metallisch schwarz, weissschimmernd. Stirn schwarz. Rückenschild erzgrün, mit vier sehr schwach kupferröthlichen Striemen und weissschimmernden Schultern. Brustseiten schwärzlich, mit breiter weissschimmernden Binde. Schildchen erzgrün. Hinterleib schwarz, zweiter und dritter Abschnitt jeder an jeder Seite mit einem grossen, die Wurzel berührenden, zwei Drittel der Länge des Abschnitteseinnehmenden, in gewisser Richtung opalisirenden Flecke; der schwarze Raum zwischen den Fleckenpaaren nur schmal; vierter Abschnitt überall metallisch schwarz. Flügel und Schwinger gelblich, Randmal lehmgelb. Beine rostgelblich, wenig weisslich schimmernd; hinterste verdickte Schenkel schwarz, mit Rostgelber Wurzel; Spitze der vordern Schenkel braun; hintere Schienen und der Spitze aller Füsse braun.—Wiedemann.

Length, 7.5^{mm}. Antennæ ochre-brown. Face metallic black, whitish pollinose. Front black. Dorsum of thorax bronze-green, with very feeble coppery reddish stripes and white sericeous humeri. Pleuræ blackish, with a broad, white pollinose stripe. Scutellum bronze-green.

Abdomen black; on each side of the second and third segments with a large spot, touching the base, and including two-thirds of the length on the sides, in some reflections opalescent; the black interval between the spots slender; fourth segment wholly metallic black. Wings and halteres yellowish; stigma luteous. Legs reddish yellow, a little whitish pollinose; hind femora thickened, black, with a reddish yellow base; tip of the anterior femora brown; posterior tibiæ, and the tip of all the tarsi, brown.—Translation.

The sex is not mentioned. The species must resemble *X. fraudulosa*, but has much lighter-colored legs.

Xylota metallifera.

Xylota metallifera Bigot, Ann. Soc. Ent. Fr., 1884, 545.

Habitat.—Colorado.

♂. Long. 10^{mm}. Tota cinereo villosa. Antennis castaneis; fronte et facie albis, genis et facie, utrinque, superne nigro pictis; thorace et scutello obscure ænescentibus, thorace obscure chalybeo vittato; calyptris albis, halteribus testaceis; abdomine nigro opaco, segmentis secundis et tertiis, utrinque, hyacintho notatis, quartis et quintis similiter tinctis; pedibus nigris, longe, sat dense, albido villosis; alis fere hyalinis, macula stigmaticali pallide fusca.

Corps entièrement couvert de longs poils gris, clairsemés; face et front blanchâtres, les joues et les côtés, près des antennes, à reflets noirâtres; thorax d'un noir bronzé, obscurément marqué de bandes bleuâtres; écusson de même couleur que le thorax; cuillerons blancs, balanciers testacés; abdomen d'un noir opaque, 2^{e} et 3^{e} segments, de chaque côté, avec une macule ovalaire allongée, la base des 4^{e} et 5^{e} segments, d'un bleu métallique; pieds noirs, cuisses couvertes de poils blanchâtres clairsemés; ailes presque hyalines, un peu roussâtres sur les nervures transversales ainsi qu'au stigmate. 1 specim.—Bigot, l. c.

Xylota coloradensis.

Xylota coloradensis Bigot, Ann. Soc. Ent. Fr., 1884, 544.

Habitat.—Colorado.

♂. Long. 10^{mm}. Antennis obscure testaceis; fronte et facie cinereo albido; thorace scutelloque obscure ænescentibus; calyptris albis, halteribus testaceis; abdomine, segmento 1^{o}, 4^{o} et 5^{o} nigris, 3^{o}, 4^{o} et 5^{o} flavo anguste marginatis, 2^{o} et 3^{o} fulvis, 3^{o} et 4^{o} macula lata, utrinque profunde bifida, 3^{o} vitta mediana, retrorsum dilatata, nigris; pedibus nigris, geniculis fulvis; alis hyalinis, macula stigmaticali testacea.

Antennes d'un fauve obscur; front et face couverts d'une pruinosité blanchâtre; thorax, écusson noirs avec quelques reflets bronzés, épaules blanchâtres; cuillerons et balanciers testacés; corps couvert d'un très fin duvet clairsemé, jaunâtre; abdomen avec les 1er, 4^{e} et 5^{e} segments noirs, 3^{e}, 4^{e} et 5^{e} finement bordés de jaune pâle, 2^{e} et 3^{e} d'un fauve rougeâtre, 3^{e} avec une large bande mediane noire, profondément bifide de chaque côté, 4ᵉ avec une bande semblable légèrement élargie en arrière; pieds noirs, genoux, base des tibias antérieurs et intermédiaires, fauves; ailes hyalines, stigmate d'un testacé pâle. 1 specim.— Bigot, l. c.

Xylota pachymera.

Xylota pachymera Loew, Centur., vi, 54.

Habitat.—Cuba (Lw.).

♀. Length, 9ᵐᵐ. Blackish steel-blue, abdomen with four luteous spots sometimes with only two, rarely with none; antennæ fuscous-black, third joint oblong; face carinate; hind femora remarkably thickened; tip of hind tibiæ produced into a tooth.

Head blackish steel-blue, front with a median fascia and the face white pollinose. Face carinate. Thorax metallic bluish-black, shining, with two more bronze-colored approximate stripes of the dorsum more thickly clothed with pile. Abdomen blackish steel-blue, sometimes more bronze colored; second segment with two oblong luteous spots, not attaining the margin of the segment, rarely obsolete; front half of the third segment shining, sometimes with two small luteous spots, posterior part black and subopaque; the following segments wholly shining, blackish steel-blue, rarely blackish bronze; venter luteous, last segments metallic. Femora blackish steel-blue, the hind pair remarkably thickened; front and middle tibiæ, except the whitish base, fuscous black, hind pair, except the white base, black, strongly arcuate, produced into a tooth at the tip; front tarsi whitish, hind tarsi blackish fuscous, the last two joints of all black. Wings blackish cinereous, stigma fuscous.

Xylota pretiosa.

Xylota pretiosa Loew, Wien. Ent. Monatschr., i, 39; Centur., vi, 53.

Habitat.—Cuba (Lw.).

♀. Length, 10ᵐᵐ. Light green-bronze, very shining; abdomen steel-blue, with four light yellow spots; the front and middle tibiæ and the basal third of the hind tibiæ, and all the tarsi, except the last three joints, whitish yellow.

Face greenish bronze, white pollinose. Antennæ black, third joint subrotund, arista of the same color. Front greenish bronze, white pollinose. Vertical triangle narrow, greenish steel-blue, shining, sparsely black pilose. Ocelli remote from the occipital margin. Thorax very light greenish bronze, near the hind margin somewhat steely blue, on each end with short white pile, between the wings clothed with black. Scutellum steel blue. Abdomen light steel-blue; second segment with two pallid yellow spots, of which the posterior angles extend to the lateral margins of the abdomen, posterior part of the segment blackish-violaceous, opaque; third segment with two transverse pallid yellow spots, forming a broadly interrupted fascia, behind these spots black violaceous, the posterior margin metallic blue. Venter pallid yellowish, first segment metallic blue, the last violaceous. Trochanters with the immediate base of the femora yellowish. Femora greenish bronze, the extreme tip of the front and middle pairs yellowish; hind femora moderately thickened, with an obtuse projection below near the tip on the lower side, and on the margin of the projection with black spines. Front and middle tibiæ very pallidly yellowish, nearly white; hind tibiæ incurved, the basal third whitish, middle third black-violaceous, distal third black; basal joints of tarsi light yellow, third joint fuscous, the last two black. Tegulæ white, the margin and the cilia black. Halteres dilutely yellowish. Wings cinereous hyaline, near the tip a little more obscure, stigma and veins black.

ADDITIONAL NORTH AMERICAN SPECIES.

Xylota arcuata Say, J. Acad. Phil., vi, 162; Compl. Wr., ii, 357.—Mexico.
Xylota subcostalis Walker, Trans. Ent. Soc. N. S., v, 291.—Mexico.

SENOGASTER.*

Senogaster Macquart, Hist. Nat. Dipt., i, 519, 1834; Dipt. Exot., ii, 2, 72.
Acrochordonodes Bigot, Bull. Soc. Ent. de France, 1878, 131.

♂. Slender, nearly bare, rather large species. Head hemispherical, formed chiefly of the eyes. Antennæ situated near the middle of the head in profile, first two joints short, third rather large, oval; arista bare. Face small, short, subcarinate, concave from antennæ to oral margin, epistoma truncate obliquely in front, margin of mouth horizontal below; cheek very narrow below the eyes. Eyes large, bare, with an area of enlarged facets in front above the antennæ; frontal triangle small, eyes contiguous for a short distance, vertical triangle long, acute; posterior orbits narrow. Abdomen long, third segment very much contracted, cylindrical, narrow, the abdomen again widened at the end. Hind femora arcuate, thickened, with a strong bifid spine below, near the tip. Wings small, shorter than the abdomen, marginal cell open, third longitudinal vein bent gently into the first posterior cell, last section of fourth vein gently sinuate, anterior cross-vein oblique, joining the fourth vein beyond the middle of discal cell.

It seems very probable that *Acrochordonodes* Bigot is but the female of a true *Senogaster*. The character in which this genus, founded upon a female specimen, is said to differ, is precisely what might be expected in that sex, viz, a less contracted abdomen. The type of *Senogaster* is *S. coerulescens* Macquart (l. c.), from Cayenne, South America.

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* Στενός, slender; γαστήρ, abdomen.

Senogaster Comstocki. (Plate XI, figs. 1, 1*a*, 1*b*.)

Senogaster Comstocki Williston, Proc. Am. Phil. Soc., xx, 326.

Habitat.—New York!

♂. Length, 12mm; of wing, 8mm. Face yellowish, blackish towards the middle, and covered with silvery white pubescence. Frontal triangle blackish, whitish near the eyes. Antennæ yellowish-red; arista yellow. Vertical triangle opaque black. Thorax black opaque, nearly bare; dorsum with four conspicuous olive-gray stripes, nearly equidistant, the lateral ones reaching from the yellowish humeri; pleuræ reddish, dusted with whitish, especially on the meso and sterno pleuræ, where it forms a conspicuous stripe; scutellum with a yellow margin. Abdomen blackish-brown; first segment as broad as the thorax, nearly black, yellow on the sides; second segment elongate, scarcely half as wide behind, with two whitish elongate spots, not reaching the hind margin; third segment of the same length, narrow, cylindrical, yellow in front, narrowly above, broadly on the sides; fourth segment as long as the preceding, expanded posteriorly, forming with the globular hypopygium an ellipsoidal mass. Legs reddish-yellow, hind femora brownish-black on the basal half; hind tarsi brownish. Wings nearly hyaline.

One specimen (Prof. J. H. Comstock).

Macquart's description and figure of *S. coerulescens* agree quite with the present species, except that the conspicuous thoracic stripes are not mentioned nor indicated. Was the specimen he described in good preservation? Bigot's *Acrochordonodes vittatus* (Bull. Soc. Ent. France, 131, 1878, female) applies very well indeed. Is it possible that they all pertain to one widespread species?

SYRITTA.*

Syritta St. Fargeau and Serville, Encycl. Meth., x, 808, 1825.

Coprina Zetterstedt, Ins. Lapp., 584, 1840.

Rather small, slender species, nearly bare, black, with yellow markings. Head hemispherical, not at all flattened, somewhat broader than the thorax. Antennæ short, third joint round; arista bare. Face small, subcarinate, nearly straight, epistoma but slightly produced. Eyes bare, very large, contiguous in the male. Thorax rather long, scutellum thin on its edge, dark-colored. Abdomen slender, more contracted in the male, about twice as long as the thorax, and not wider. Front and middle legs slender and small, the hind femora extraordinarily thickened, with short rigid spines below; hind tibiæ bent. Marginal cell of wing open; third vein gently curved; anterior cross-vein near the middle of discal cell rectangular. Type of genus, *S. pipiens* (Linné).

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* *Συρίζειν*, to hum.

Syritta pipiens (Plate XII, figs. 1, 1*a*, 1*b*, 1*c*).

Musca pipiens Linné, Fauna Suecica, p. 1822, 1761; Schrank, Enum. Insect. Austr., 915.

Conops pipiens Scopoli, Entom. Carniolica, 969.

Syrphus pipiens Fabricius, Spec. Insect., ii, 434, 65; Entom. Syst., iv, 310, 119; Panzer, Fauna Germ., xxxii, 20.

Milesia pipiens Fabricius, Syst. Antl., 194, 27; Fallen, Syrph., 12, 9.

Coprina pipiens Zetterstedt, Ins. Lapp., 584, 45.

Xylota pipiens Meigen, Syst. Beschr., iii, 213, 1.

Xylota proxima Say. Amer. Ent., i, pl. viii; Compl. Wr., i, 16; Wiedemann, Auss. Zw. Ins., ii, 102, 9.

Syritta pipiens Macquart, Hist. Nat. Dipt., i, 525, 1; Meigen, Syst. Beschr., vii, 113, pl. lxvii, fig. 21; Zetterstedt, Dipt. Scand., ii, 881, 1; viii, 3193; Schiner, Verh. Zool.-Bot. Gesellsch., vii, 424; Fauna Austr., i, 357.

Habitat.—Throughout the United States!, Europe, Asia, Africa.

♂ ♀. Length, 7 to 8^{mm}. Face and front satiny, yellowish white. Front of female narrow above, shining black on upper half with two small pollinose spots; vertical triangle of male elongate, shining black, pollinose in front. Antennæ reddish yellow. Dorsum of thorax black, bare in front, with two approximate pollinose spots; the humeri and behind them, reaching to the suture, yellowish white pollinose. Pleuræ thickly whitish pollinose. Abdomen in the male as follows: Black, first three segments opaque, the fourth and the hypopygium shining: the narrow sides of the first segment, and a broad spot on each side of each of the two following segments, yellow, often whitish pollinose; fourth segment in front with a narrow interrupted yellowish white pollinose cross-band, the hind margin of the segment narrowly yellow. In the female the spots smaller, the sides of the third segment in front metallic, scarcely at all yellow, but with a light pollinose spot; otherwise like the male. Four front legs yellowish red, with obscure brownish markings; hind femora black, with the base and a usually incomplete ring near the middle, reddish yellow; hind tibiæ reddish yellow, at the middle and tip brown or black; hind tarsi reddish yellow, more or less brown on the upper side. Wings hyaline.

The most common species in the family, everywhere and at all times abundant from spring till autumn.

ADDITIONAL NORTH AMERICAN SPECIES.

Xylota Mexicana Bigot, Ann. Soc. Ent. Fr., 1884, 539.—Mexico.

CHRYSOCHLAMYS.*

Ferdinandea Rondani, Ann. delle Scienze Nat. di Bologna, 1844.

Chrysochlamis Rondani in litt.; Walker, Insect Brit., i, 279, 1851.

Moderately large species, metallic-golden or bronze-green, with light-colored pollinose stripes on the dorsum of the thorax. Head hemispherical, somewhat broader than the thorax. Antennæ short, third joint rather large, obliquely oval or rounded, arista naked, basal. Face gently concave in profile below the antennæ, with an obtuse tubercle near the middle. Eyes pilose, contiguous in the male. Scutellum large, yellowish, translucent, its border and the lateral borders of the thoracic dorsum with macrochætæ. Abdomen not much longer than the thorax, elliptical, thickly pilose. Legs slender, the hind pair scarcely elongated. Marginal cell of wings open, the third vein gently concave into the first posterior cell; anterior cross-vein near the middle of discal cell, oblique. Type of genus, *C. aurea* (Scop.) Walker.

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* Χρυσός, gold; χλαμύς, a mantle.

TABLE OF SPECIES.

1.—Hind borders of the second and third abdominal segments black, opaque; arista reddish 2
Hind borders of these segments not opaque black 4
2.—Face in the middle with a V-shaped black spot 3
Facial spot indistinct in outline; front femora at base and the tip of all the tarsi black . . . . buccata, ♀
3.—Legs reddish-yellow . . . . dives
All the femora brown; tibiæ likewise infuscated . . . . nigripes, ♂
4.—Facial spot V-shaped; arista reddish . . . . nigripes, ♀
Facial spot indefinite in outline; arista black . . . . crœsus

Chrysochlamys crœsus.

Chrysochlamys crœsus Osten Sacken, Western Diptera, 341.

Habitat.—Utah (O. S.), California, Washington Territory, New Mexico!

♀. Length, 8 to 11^{mm}. Resembles *C. dives* closely, but the abdomen lacks the subopaque hind margins of the second and third segments; the pile of the abdomen is longer, the general form broader. The brown spot on the facial tubercle is of an indefinite outline, not V-shaped as in *C. dives* and *nigripes*. Antennæ reddish-brown, more nearly uniform in color; the arista black. Abdomen uniformly of a bright bronze-green, thickly beset with golden yellow pile. Legs sometimes of a wholly saturate reddish-yellow, but the base of the femora often fuscous, or even blackish.

♀. Front with a broad pollinose cross-band, the dorsum of the thorax with more distinct pollinose stripes.

Three males and one female (H. K. Morrison, G. F. Gaumer).

Chrysochlamys dives. (Plate XI, figs. 5, 5*a*.)

Chrysochlamys dives Osten Sacken, West. Dipt., 341.

Habitat.—Illinois, Missouri, Canada! Kentucky (O. S.).

♂, ♀. Length, 8 to 12^{mm}. Face largely covered with ochraceous pollen, in the middle with a large V-shaped black spot, shining; cheeks shining, in front with a narrow black stripe. Front of female shining black, across the middle with a broad ochraceous pollinose band. In the male the frontal triangle is black, shining above the base of the antennæ only, pollinose along the eyes; first and second joints of the antennæ blackish above, reddish below, the third joint dark brown on the upper half or two-thirds, yellowish-red below; the arista reddish. Thorax beset with blackish or lutescent pile, lateral margins and a stripe of even width each side of the middle, cinereous pollinose; bristles black; scutellum lutescent or yellowish, with short yellow pile. Abdomen pure bronze-colored, densely beset with short golden-yellow pile in the female, somewhat darker in the male; the black sub-opaque hind borders of second and third segments sub-interrupted. Legs saturate yellow; the last two joints of tarsi infuscated or blackish; the four front femora (male ?) may have a dark-brown spot in front. Wings yellowish hyaline on the antero-proximal portion, grayish hyaline along the posterior portion; costal cell yellow, stigma darker; a brown cloud, in the shape of a short cross-band, between the origin of the third vein and the cross-vein at the base of the last posterior cell; anterior cross-vein likewise clouded with brown.

Four specimens (D. W. Coquillett, Professor Riley, G. J. Bowles).

Chrysochlamys buccata.

Chrysochlamys buccata Loew, Centur., iv, 72.

Habitat.—Virginia (Lw.).

♀. Length, 8^{mm}. Bronze colored; scutellum testaceous; front black, with a cross-band of ochraceous pollen in the middle; antennæ black above, reddish below; arista reddish; cheeks with a black stripe. Blackish-bronze colored, greenish shining; front deep black, shining, with short black pile; in the middle a rather broad cross-band of ochraceous pollen. Antennæ rather large; first joint black, the second and third joints black above, reddish below; arista bare, reddish. Face reddish yellowish, very concave and ochraceous pollinose above, swollen below, with a large obtuse, somewhat brownish tubercle; cheeks separated from the face by a narrow black stripe. Dorsum of thorax clothed with short lutescent pile; lateral margins, and two longitudinal stripes of even width, cinereous pollinose. Scutellum reddish, with short lutescent pile; bristles on the margin black; lateral corners blackish. Abdomen shining, with short lutescent pile; hind margin of first and second segments opaque black. Legs ochraceous, the basal half of the four front femora and the tip of all the tarsi black; front tibiæ, except the base and tip, and the base of the hind femora, slightly subinfuscated. Wings somewhat cinereous hyaline, lutescent near the base; costal cell and stigma luteous, the base of the third vein and the cross-veins at the middle of the wing clouded with black.—Translation.

Chrysochlamys nigripes.

Chrysochlamys nigripes Osten Sacken, West. Dipt., 341.

Habitat.—Massachusetts (O. S.).

"♂, ♀. Length, about 9^{mm}. General color much duller than in *C. dives*, metallic blackish-green; pollen on the face and front dull yellowish; frontal pollinose cross-band (♀) much narrower, and hence the black shining space above the antennæ larger. The prevailing pubescence on thorax and scutellum is black; black, opaque hind margins of the segments two and three in the male only, *not in the female.* Femora brown, except the tip; tibiæ brownish yellow, more or less infuscated before the tip, especially the front pair; tarsi brownish red at base, brown at tip. Wings grayish hyaline, feebly tinged with brownish yellow at the root and on the stigma; costal cell sub-hyaline in the female; brownish clouds on cross-veins very weak."—O. Sacken, l. c.

MERAPIOIDUS.

Merapioidus Bigot, Bull. Soc. Ent. de France, 1879, 64.

Large, pilose species; black, with metallic bands on the abdomen. Head subtriangular in front view. Front of female short, but little inclined, nearly plane, moderately broad. Antennæ: first joint slender, cylindrical, about three times as long as the short second joint; third joint very broad, short, in front slightly concave, below the insertion of second joint prolonged downward, obtuse; above extended into a conical point, slightly convex on the upper posterior part and terminating in the arista, which is a little thickened at its base. Face extending downward, not descending far below the eyes, obtusely conical below, gently concave below the antennæ, and with an obtuse tubercle. Eyes bare. Abdomen depressed, broad, elliptical. Legs simple. Wings: marginal cell open; third longitudinal vein nearly straight; last section of fourth vein slightly sinuate, joining the third before the costa; anterior cross-vein oblique, joining the fourth vein near the outer third of the discal cell. Type of genus, *M. villosus* Big., North America.

Merapioidus villosus. (Plate XI, figs. 2, 2*a*.)

Merapioidus villosus Bigot, Bull. Soc. Ent. de France, 1879, 64.

Habitat.—Georgia!

♀. Length, 14^{mm}. Front black, a little metallic, moderately shining, with reddish pollen and black pile. Antennæ black. Face, except broadly on the tubercle and thence to oral border, covered with dense whitish-yellow dust and whitish pile. Cheeks black, shining. Proboscis short. Pile on the lower posterior orbits long, whitish. Thorax obscurely metallic, moderately shining, the pile moderately thick and rather long, more abundant and whitish on the pleuræ; post-alar callosities with tufts of thick, long, whitish pile. Abdomen opaque black, with long whitish pile on each side near the base and along the lateral margins, elsewhere short; first segment with a small shining spot on the hind margin on each side; second segment with a large subtriangular spot on each side and narrowly in the middle behind; third segment with a broad fascia, broadly interrupted, and a small obtuse, posterior, median triangle; fourth segment with a narrower fascia narrowly interrupted; fifth segment on the anterior margin, shining metallic. Legs black, with white pile; femora at tip, and tibiæ at base and tip, reddish. Wings hyaline; subcostal cell from tip of auxiliary vein yellowish; cross-veins faintly clouded.

One specimen which agrees sufficiently well with Bigot's description of male and female.

SPILOMYIA.*

Spilomyia Meigen, Illiger's Magazine, ii, 273, 1803.
Mixtemyia Macquart, Hist. Nat. Dipt., i, 491, 1834.
Calliprobola Rondani, Dipt. Ital. Prodr., i, 47, 1856.

Large robust species, black with bright yellow spots or bands on thorax and abdomen—wasp-like in appearance. Head hemispherical, broader than the thorax. Antennæ porrect, moderately or considerably elongated, the third joint usually rounded, not twice as long as broad; arista bare. Eyes bare, contiguous in the male. Face nearly vertical, gently concave in profile below the antennæ, only a little tuberculate below, if at all. Thorax short and broad, considerably convex above, with yellow spots. Abdomen twice or more as long as the thorax, very convex above, usually of nearly equal width throughout, sometimes gently or broadly oval; with yellow bands. Legs strong; hind femora elongate, with a projecting tooth below near the outer part. Wings brownish in front; marginal cell open, third longitudinal vein nearly straight, the vein beyond the tip of the anal cell is continued outward, nearly parallel to the hind border of the wing.

Type of genus, *S. diophthalma* Linné, Europe.

TABLE OF SPECIES.

1.—Second joint of antennæ much longer than the first; second segment of the abdomen with a broad arcuate yellow band, the third and fourth with a slender, median interrupted one . . . . **quadrifasciata**
Second joint of the antennæ not much longer than the first; abdomen not so marked 2
2.—Abdomen yellow; first segment, except the lateral angles, black, each of the following segments with two narrow black bands, the one on the anterior margin entire, the others interrupted . . . . **hamifera**
Abdomen black, with yellow cross-bands 3
3.—First and second abdominal segments wholly black, third with a posterior cross-band, fourth with two, the anterior one interrupted; abdomen broadly oval . . . . **fusca**
First segment with a yellow side spot, the following each with two cross-bands, 4
4.—First, third, and fifth cross-bands interrupted (or sub-interrupted) the latter two distinctly dilated on the sides 5
First and third cross-bands entire . . . . **longicornis**
5.—Pleuræ with five yellow spots besides the humeral and subalar ones; front of female with a black stripe . . . . **interrupta**
Pleuræ with only four spots besides the humeral and subalar ones; front of female yellow across the middle; scutellum with a yellow, disconnected spot on each side . . . . **liturata**

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* Σπίλος, mountain; μυια, fly.

Spilomyia longicornis.

Spilomyia longicornis Loew, Centur., x, 49.

Habitat.—Illinois, Pennsylvania, District of Columbia, New England!, Texas, Kansas (O. S.)

♂, ♀. Length, 11 to 13^{mm}. Eyes of male contiguous, vertical triangle on the upper half black, below yellow; frontal triangle yellow, with a large triangular black spot above the antennæ. Front in female yellow on the sides, with a black stripe broad below, attenuated above, vertex black. Antennæ brownish black, sometimes partly, never wholly, brownish red, first two joints somewhat elongate, arista luteous. Face yellow, with a median stripe attenuate above, and a narrow stripe from the eyes to the oral margin, on the cheeks, black. Thorax black, humeri, and a rounded spot to the inner side, a ʌ-shaped spot in front of the scutellum, and a vittula running from each post-alar callosity to near the suture, and then bent inwards, yellow, sometimes also a small yellow spot above the suture in front of the root of the wings. Pleuræ with five yellow spots beside the humeral and sub-alar ones; an elongate one on the meso-pleuræ and one below on the sterno-pleuræ, one just above the anterior coxæ, one on the ptero-pleuræ, and a broader one behind, below the tegulæ, the three latter nearly coalescent. Margin of scutellum yellow. Abdomen black opaque, second, third, and fourth segments each with two narrow yellow bands connected by the yellow lateral margins; first band dilated on the sides, the third and fifth usually very narrowly interrupted. Hypopygium yellow; in the female the fifth segment black, with a narrow yellow border. Legs yellow; front tibiæ except the base, and the front tarsi, black; hind femora sometimes darker towards the end; apex of hind tibiæ and the tarsi ochraceous. Wings sub-hyaline, in front brownish; last section of sixth vein nearly as long as the posterior basal cross-vein.

Spilomyia liturata, n. sp.

Habitat.—New Mexico!

♀. Length, 14^{mm}. Antennæ brownish red, elongate; first joint as long as the third, second joint a half longer than the first. Face bright yellow, with a slender black stripe, not reaching quite to the antennæ; front like the face, in the middle with a black stripe, broader below, very narrow just below the black vertex. Dorsum of thorax nearly opaque black, with bright yellow markings, as follows: a spot on the humeri, and one of nearly the same size on the inner side of each, post-alar callosities, extending as a slender vittula forwards, the anterior end of which is curved inwards, a spot on each side of the scutellum, a large oval spot on the meso-pleuræ, a smaller rounded one below on the sterno-pleuræ, one of about the same size on the sides of the metanotum, and a smaller one above the front coxæ. Abdomen nearly opaque black, with two yellow cross-bands on the second, third, and fourth segments; the first cross-band of each segment is rather broad, strongly dilated on the sides, and only sub-interrupted in the middle; the posterior margins of the second-fifth segments with the bands of equal width throughout, not interrupted. Legs yellow; the four hind tibiæ at the tip and their tarsi reddish, the front tibiæ, except the base, and their tarsi black; hind femora broadly blackish on the posterior side. Wings with a brown anterior border, nearly hyaline behind.

One specimen, New Mexico (G. F. Gaumer). The present species is nearly related to *longicornis* and *interrupta*, but is at once distinguishable from the former by the longer antennæ; from the latter by the antennæ being a little longer, by the abdominal bands being entire, or not distinctly interrupted; from both by the spots on the pleuræ, and the greater width of the abdominal bands.

Spilomyia interrupta. (Plate XII, fig. 4.)

Spilomyia interrupta Williston, Proc. Am. Phil. Soc., xx, 327.

Habitat.—Washington Territory!

♀. Length, 13 to 14^{mm}. Closely allied to *longicornis*, but differs in the bands of the abdomen being a little broader, the first, third, and fifth very distinctly interrupted, and the two latter more dilated on the sides, in the fifth segment in the female being in large part yellow, in the presence of a small yellow spot on the sides of the dorsum above the meso-pleuræ, in the spots of the pleuræ being smaller and distinctly separated from each other, not coalescent, and in the antennæ being a little longer. The cheeks are darker, and the hind femora on the posterior side near the end may be quite black. The wing is broader, and the last section of the sixth vein is distinctly shorter. All of these differences may not be persistent in a large number of specimens, but they are certainly sufficient to show that the species is distinct.

Two specimens, Washington Territory. The relationship of *S. longicornis*, *S. liturata*, and *S. interrupta* with the European *S. saltuum* and *S. diophthalma* is remarkably close.

Spilomyia fusca.

Spilomyia fusca Loew, Centur., v, 34.

Habitat.—Pennsylvania, Massachusetts, New Hampshire, Georgia, Canada!

♂, ♀. Length, 16 to 17^{mm}. Head light yellow, somewhat shining, and with short, sparse, whitish pile; vertex, an incomplete frontal stripe below, and an oval spot on the face, black. Antennæ reddish black, the first two joints often quite black. Occiput black, orbits whitish pollinose. Thorax opaque brownish black, with yellow markings as follows: humeri, a rounded spot at their inner side, two oval spots, forming an obtuse angle, in front of the scutellum, a vittula on each side, extending from the post-alar callus and bent inwards in front to meet the suture, margin of scutellum, a large meso-pleural, a smaller sterno-pleural and another above the base of the front coxæ. Abdomen broadly oval, brownish black, very shortly black pilose; third segment with a yellow band on the posterior border, and on each side near the middle with a small triangular spot; fourth segment with two fasciæ, the anterior one narrowly interrupted, the posterior one rather broad, on the hind margin. Hypopygium wholly light yellow. Venter blackish brown, the incisures light yellowish. Femora blackish, brownish, and yellow, varied; front tibiæ, except the yellow base, brown or black; middle and hind tibiæ light yellow, the tip dark ochraceous; front tarsi black, middle and hind tarsi like the tip of their tibiæ. Wings sub-hyaline, the anterior part brown.

Numerous specimens. The pile of the top of the head is blackish.

Spilomyia hamifera.

Spilomyia hamifera Loew, Centur., v, 33.

Habitat.—Pennsylvania, Virginia, Florida, Kentucky (Loew, O. S.), New Hampshire!

♀. Length, 17mm. Head light yellow, front and face narrowly black vittate, the stripes more or less obsolete on the upper part of each; cheeks with a brownish-black stripe. Antennæ brownish, or brown, with the margins of the third joint darker. Vertex black; occiput blackish, the orbits with whitish pollen. Thorax black, with yellow markings as follows: on the anterior margin of the dorsum with four spots, a vittula reaching from the posterior angle to the suture, curved inwards in front, and two spots in form of an inverted V in front of the scutellum. On the pleuræ, beside the humeri, two large spots and a more whitish one above the base of the front coxæ, sometimes obsolete. Scutellum yellow, the base brownish or black; metanotum black, with a yellow spot on each side. Abdomen yellow; first segment, except the lateral angles, black; each of the following segments with two narrow black bands, the one on the front margin entire, the median one interrupted, or subinterrupted. The black band in front of each segment is narrowed near the lateral margin by a more or less large process from the yellow behind. Venter black, posterior margin of each segment yellow. Legs yellow, front tibiæ and tarsi black. Anterior portion of wings brown, posterior hyaline.

One specimen, White Mountains, New Hampshire, July 31.

Spilomyia pleuralis, n. sp.

Habitat.—Mexico!

♂. Length, 14mm. Face yellow, a slender stripe in the middle, not reaching the antennæ, and a slender vittula on each cheek black. Antennæ dark brown, the three joints of nearly equal length. Frontal triangle shining black, narrowly along the eyes and on each side below white pollinose. Dorsum of thorax black, with the following light yellow marks: the humeri, a small spot on the inner side of each, a small spot near the outer end of the suture, a vittula running from each postalar callus and continued inwards as a pollinose spot, and two slender vittulæ in the shape of an inverted V in front of the scutellum; scutellum black, narrowly margined with yellow; pleuræ light yellow, the sutures black. Abdomen black, lightly shining, in shape broadest at base of the second segment, then diminishing in nearly a straight line on each side to the tip of the fourth; second segment with a small yellow spot on each side; the second, third, and fourth each with a larger, sub-triangular spot on each side; second and third segments each with a slender posterior cross-band, that on the third narrowly interrupted in the middle; fourth segment with a large spot on each posterior angle. forming a broadly interrupted cross-band. Legs, including the coxæ, light yellow, the tips of front and hind tibiæ and their tarsi brown, hind femora broadly black along their upper surface except at their base. Wings hyaline, with the usual brown border in front.

One specimen, in the Osten Sacken collection at Cambridge.

Spilomyia (Mixtemyia) quadrifasciata. (Plate XII, fig. 3.)

Paragus quadrifasciatus Say, Long's Exped., Append., 377; Compl. Wr., i, 257.
Psarus quadrifasciatus Wiedemann, Auss. Zw. Ins., ii, 91, 2.
Mixtemyia quadrifasciata Macquart, Hist. Nat. Dipt., i. 491; tab. xi, fig. 3; Osten Sacken, Cat. Dipt, 139.

Habitat.—Canada, New Hampshire, Massachusetts, Connecticut, New York!

♂, ♀. Length, 12^{mm}. Vertex black with whitish pile; below, the front of the female has a narrow yellow stripe of even width along the eyes; frontal triangle narrowly black immediately above the antennæ; vertical triangle long, yellow in front. Antennæ reddish brown or brownish black, the first joint reddish or yellowish, moderately elongated. second joint much so, nearly twice as long as the first; third joint trapezoidal, a half longer than wide; arista yellow. Thorax with a small spot on the humeri, a larger one to the inner side, a slender vittula above the wings, two slender spots in the form of an inverted V in front of the scutellum, the narrow margin of the scutellum, a large elongate spot on the meso-pleuræ, a large rounded one on the sternopleuræ, and a smaller one, sometimes obsolete, above the front coxæ yellow. Abdomen elongate, cylindrical, scarcely wider than the thorax with four yellow bands, the first broad, conspicuous, strongly arcuate the convexity in front, situated on the second segment; the second and third on the middle of the third and fourth segments, slender, only a little arcuated, the second narrowly interrupted in the middle, the third usually entire; the fourth band on the posterior margin of the fourth segment; on the posterior angles of the second and third segments there is a small yellow spot, extending a short distance narrowly inward. The abdomen is a little shining, except on the second segment with a faint bluish reflection; the pile on the hind part whitish. Base of hind and middle femora, basal two-thirds of hind and middle tibiæ and narrow base of front tibiæ light yellow; front legs elsewhere reddish brown, the tarsi more black; tip of middle and hind tibiæ and their tarsi light ochraceous; hind femora, except the base, nearly black Wings elongate, brownish along the front border, hyaline behind.

Spilomyia (Mixtemyia) ephippium.

Mixtemyia ephippium Osten Sacken, Bull. Buff. Soc. N. S., iii, 70; Cat. Dipt., p. 254.

Habitat.—Mexico (O. S.)!

♂. Length, 12^{mm}. Face yellow, with a brown stripe in the middle, which does not quite reach the antennæ; the latter brown; second joint almost black; triangle of the vertex dark brown. Thorax dark brown; a brownish yellow angular line runs from the scutellum, above the root of the wings, turning inside to follow the thoracic suture and stopping before meeting the corresponding line on the other side; a less distinct angular line, on the anterior part of the thorax, begins on each side, at the yellow humeral tubercle, follows the anterior margin of the thorax and before reaching its middle, turns backwards; in the middle of the anterior margin, between the two angular lines, two delicate, short parallel yellow lines are perceptible. Scutellum brown in the middle, with yellow borders. Pleuræ brown; a yellow spot above the root of the front coxæ. Abdomen light brown; second segment with an arcuated yellow stripe, resting with its middle on the anterior, with its ends on the posterior margin, which is also yellow; the inside of the semicircle thus formed, is dark brown, velvety; the third and fourth segments are clothed with a fine sericeous down; the third has a distinct tubercle in the middle and is margined with yellow posteriorly; the fourth is traversed by a yellow cross-band in the shape of an inverted V, the ends of which do not reach the lateral margins; hypopygium brown. Anterior half of the wings brown, the posterior hyaline; the anal cell, the second posterior, the discal, and a part of the first posterior cell, as well as the whole posterior margin, including the alula, being hyaline (in *M. quadrifasciata* the second basal cell and the whole portion of the first basal, situated behind the spurious vein, are also hyaline). Legs; femora dark brown, the hind ones with a strong tooth on the under side; tibiæ yellowish brown, pale yellow at the base; front tarsi brown; middle and hind ones reddish brown, last two or three joints brown.—Osten Sacken.

This species, the type specimens of which I have examined in the museum at Cambridge, is much like *quadrifasciata* in general appearance, but is easily distinguishable.

ADDITIONAL NORTH AMERICAN SPECIES.

Spilomyia pallipes Bigot, Ann. Soc. Ent. de Fr., 1883, 352.—Mexico.

TEMNOSTOMA.*

Temnostoma St. Fargeau and Serville, Encycl. Meth. x, 518, 1825.

In structure nearly like *Spilomyia*, but differs in the hind femora being without a tooth below on the outer part. The markings, moreover, of the thorax and abdomen are composed of very dense pollen, and may be more or less effaced, whereas in *Spilomyia* they are of the ground color. Properly speaking, these characters are not of more than subgeneric value, as indeed they were so considered by Schiner. The species are, like those of *Spilomyia*, strikingly similar or identical with the European ones.

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* *Τεμνειν*, to cut; *στομα*, mouth.

TABLE OF SPECIES.

1.—Abdomen with three or four yellow pellinose crossbands of nearly equal width . . . . **bombylans**

Abdomen broadly oval, with more than four cross-bands, of unequal width . 2

2.—The thorax has, in addition to the other spots, two separated ones on each side on the suture 5

The thorax has, in addition to the other spots, only one, elongate spot on each side 3

3.—Femora mostly yellow; the distal part of the abdomen with broad yellow cross-bands leaving but very narrow black cross-bands 4

All, or at least the front, femora broadly black; the black interrupted cross-bands of distal portion of abdomen broader . . . . **aequale**

4.—Scutellum, except the base, densely yellow pollinose . . . . . . **pictulum**

Scutellum, except the base, shining metallic . . . . **excentricum**

5.—Second segment of abdomen with a broad anterior cross-band, distal segments with three transverse black spots . . . . **alternans**

Second segment without anterior cross-band, distal segments with a broad interrupted black cross-band; pile of scutellum black . . . . . **venustum**

Temnostoma bombylans. (Plate XII, fig. 6.)

Milesia bombylans Fabricius, Syst. Antl., 189, 8; Panzer, Fauna, viii, 11; Meigen, Syst. Beschr., iii, 233, 6; Macquart, Hist. Nat. Dipt. 1, 534, 6.

Milesia Zetterstedtii Fallen, Syrph., 8, 1.

Temnostoma bombylans St. Fargeau and Serville, Encycl. Meth., x, 518

Doros Balyras Walker, List, etc., iii, 577.

Spilomyia bombylans Schiner, Fauna Austr., i, 365.

Temnostoma obscura Loew, Centur., v, 35.

Temnostoma Balyras Osten Sacken, Cat. Dipt., 138, 253.

Habitat.—New York, Connecticut, White Mountains, Pennsylvania!

♂, ♀. Length, 10 to 11^{mm}. Face black, shining, covered with dense yellow pollen on the sides; cheeks bare and shining black. Frontal triangle black, clothed with yellow pollen, except above the antennæ. Eyes in the male narrowly separated. Front in female lightly pollinose on the sides. Face of male usually with a slight convexity in the middle, sometimes, however, quite straight or even gently concave throughout, as in the female. Antennæ varying from light yellow to quite brownish. Thorax nearly opaque black; humeri, the suture on each side, a small spot above the wings, and a vittula in the mesopleura, thickly yellow pollinose. Abdomen black, but little shining, of nearly equal width throughout, a little oval in the female; the second, third, and fourth segments (in the female the fifth also) with a complete yellow band, moderately arcuated, the convexity approaching the front margin of the segments; all of the bands margined with opaque black.

Hypopygium shining black. Front legs black, immediate base of femora, knees, and base of tibiæ, yellow; middle and hind femora black except base and tip; hind tibiæ usually with a broad blackish preapical ring; tip of middle and hind tarsi frequently blackish. Wings hyaline in front, towards the base more reddish, beyond brown.

Twenty-five specimens, mostly caught about blossoms of *Cornus paniculata* in the latter part of June. New York (Professor Comstock), Pennsylvania (Keen).

In his description of *T. obscura*, Loew says: "A *T. bombylanti*, cui simillima, facei tuberculo minuto quidem, sed manifesto differt." But, unfortunately, although the facial tubercle or convexity is not inconspicuous in some specimens, in others it is absolutely wanting. From this fact, and because they agree throughout with the descriptions of the European specimens, I must agree with Jaennicke (Neue Exot. Dipt., p. 4) in considering the species the same.

Temnostoma pictulum.

Habitat.—Pennsylvania!

♀. Length, 12 to 14^{mm}. Head black; face and front thickly clothed with golden-yellow pollen, a median stripe reaching from the vertex over the base of the antennæ to the oral margin, and the cheeks, bare, shining. Antennæ wholly light yellow. Thorax black, with bright golden pollinose markings as follows: A spot on the humeri, an interrupted band on the suture, a large oval spot in front of the post-alar callus, two spots of about the same size as the last in front of the scutellum, nearly confluent, the scutellum, except the base, a spot on the meso-pleuræ and one on the sterno-pleuræ. Abdomen golden-yellow opaque; first segment, the anterior margin of the second, and the very slender front margins of the third and fourth, a cross-band on the middle of second segment, not reaching the margins, similar, but successively narrower ones (almost linear on the last), on the following segments, black. Legs yellow; front tibiæ, except the base, and front tarsi, deep black. Wings brown along the front border, sub-hyaline behind.

Two specimens, Pennsylvania (Mr. Eugene L. Keen). Is most nearly allied to *T. excentricum*, but the scutellum is golden pollinose, not shining; the spots on the thorax are larger, and there are two separated spots in front of the scutellum instead of one triangular one; the median black bands of the abdominal segments are not distinctly interrupted in the middle, the front of the female is broader above and the insect is smaller.

Temnostoma excentricum.

Milesia excentrica Harris, Insects of New Eng., injur. to Veget.; Osten Sacken, ibid, 3rd ed., 609, fig. 267 (male).

Temnostoma excentrica Osten Sacken, Cat. Dipt., 138, 253 (male).

Habitat.—Massachusetts, Tennessee!, Illinois (O. S.).

♀. Length, 6$^{\text{mm}}$. Size and markings of head, thorax, and wings as in *T. aequale*, the legs "ochre-yellow, except the shanks and feet of the first pair, which are black" (Harris). Abdomen mostly yellow, first segment black, an anterior fascia and a middle one moderately broad on second, a very narrow interrupted black fascia on third, fourth, and fifth, and the hind margins of all the segments black. The narrow fasciæ might be better described as pairs of narrow transverse spots. The yellowish triangular spot in front of the scutellum is more conspicuous than in my specimens of *T. aequale*.

About the present species there has been some confusion, and I am not at all sure that I can definitely settle it. The three or four species are very closely allied, and only a considerable amount of material will enable one to determine with certainty their true relations. The differences only consist in the color of the femora, an additional spot on the thoracic suture, and the abdominal bands. The present species is apparently the same as the male that Osten Sacken described in Harris' Report (3rd ed., p. 609), the female of which he afterwards decided (Cat. Dipt., p. 253) does not belong with it, and which I have called *T. venustum*. The chief evidence that I have, however, is a specimen without abdomen, kindly loaned me by Mr. S. Henshaw, of the Boston Society of Natural History, bearing the label "179—T. W. H.," and which, most probably, was a specimen used by Harris when he made the brief description. This specimen has the single elongate sutural spot on each side, so that it cannot be *T. alternans;* the legs are, however, as he described them—that is, yellow, except the front tibiæ and tarsi, while *aequale*, according to Osten Sacken's and my own observations, always has the femora more or less black. A single specimen that I have from Tennessee agrees both with this and the males Osten Sacken described, the abdomen being as I have described it above. Hence I think that the conclusion here given is the correct one; at least we have no evidence to gainsay it. That it is nothing more than a variety of *aequale* I am not prepared to say; in such case this name will have precedence.

Temnostoma alternans. (Plate, XII, figs. 7, 7*a*.)

Temnostoma alternans Loew, Centur., v, 37.

Habitat.—Canada, Maine, New Hampshire, Connecticut, Pennsylvania Massachusetts!.

♀, ♀. Length, 12 to 15$^{\text{mm}}$. Head thickly golden yellow pollinose; the vertex, a median frontal and facial stripe, and the cheeks shining black; pile of the vertex black. Antennæ reddish or yellow. Face gently concave in the middle. Thorax brownish black, a little shining; the humeri, a rounded spot at outer end of suture, and a smaller one toward the middle, a vittula running from the post-alar callus to near the suture, a triangular spot in front of the scutellum, and a large elongate spot on the meso-pleuræ, bright yellow, the color due to pollen, which in rubbed specimens not infrequently is greyish, or even obsolete. A square spot at the inner side of the humeri deep opaque black; in the middle of the dorsum in front, a broad, faintly grayish, pollinose stripe. Scutellum opaque at its base, broadly metallic shining green on its border; pile blackish. Abdomen oval, golden yellow and black, opaque; first segment black; second segment black with two yellow cross-bands, connected on the lateral margins, the first narrowly, the second very broadly interrupted; third segment with a median black cross-band, dilated in the middle diamond-shaped, sometimes cut off from an oval spot on the sides, the first band interrupted by a linear space; fourth and fifth segments with three small black spots each, the middle one larger, on the fourth segment sometimes coalescent; margins of the segments narrowly black. Legs reddish yellow; front tibiæ (except the base) and their tarsi deep black; front femora at their base, and sometimes the other pairs below near the base, more or less black. Wings brownish in front, nearly hyaline behind, the third vein beyond the cross vein broadly hyaline along its sides.

Eight specimens. One specimen from Pennsylvania (Keen) has the first yellow cross-band of the abdomen more broadly interrupted than the second, the yellow each side not reaching a third of the way across; the base of all the femora are also more blackish.

Temnostoma venustum, n. sp.

Temnostoma excentrica Osten Sacken, Harris' Ins. Inj. to Vegetation, 3d. ed., p. 610; Cat. Dipt., p. 253, note (female).

Habitat.—Massachusetts, Lake Superior (O. S.), New Hampshire.

♀.–Length, 15^{mm}. Very closely allied to *T. aequale*, but differs in having two yellow spots on the suture (like *T. alternans*) on each side. The pile of the scutellum is black, the second abdominal segment lacks the anterior cross-band, and the hind one is confined to the sides, the lateral margins of the segment also being narrowly yellow; both cross-bands of the third segment are narrow, the anterior one of the fourth segment also. The remaining ones are broader, and the black is interrupted in the middle of the fourth and fifth. In my single specimen the two hind femora are brown, the front one black, except the tip.

One specimen, White Mountains, New Hampshire (S. Henshaw).

Temnostoma aequale.

Temnostoma aequalis Loew, Centur., v, 36.

Habitat.—British North America (Lw.), New England, Colorado!

♂, ♀. 14^{mm}. Head yellowish-white pollinose, vertex, median frontal and facial stripe and cheeks shining black, vertical triangle black, below pollinose. Antennæ reddish or brownish. Thorax black, but little shining, in front in the middle a little grayish; humeri, the sutures, supra-alar vittula, and an elongate spot on meso-pleura, yellowish gray. Scutellum metallic shining, its base narrowly opaque; pile yellowish. Abdomen black, moderately shining, the segments, except the first, each with two yellowish white cross-bands; on the second segment, the first is broad, nearly entire, the second narrow, sometimes confined to the sides of the hind border; third segment with both entire, the hind one the narrower; fourth and fifth segments similar, both of nearly equal width and connected in the middle; hypopygium pitchy. Front legs black, the knees luteous, sometimes the outer part of femora also; middle and hind femora usually blackish, except the ends, sometimes only brownish on the base; middle and hind tibiæ and tarsi reddish yellow, the last joint of tarsi darker. Wings brownish in front, hyaline behind.

Ten specimens, Dr. Dimmock (July 25, White Mountains), E. Burgess, Professor Riley (Vetà Pass, Colo.).

MILESIA.

Milesia Latreille, Hist. Nat. Crust. Ins., xiv, 361 (1804), Fabricius.
Sphixea Rondani, Dipt. Ital. Prodr., ii, 185.

Very large, robust, nearly naked species, black or yellowish brown, with yellow thoracic and abdominal markings. Head hemispherical, broader than thorax. Antennæ not long, porrect, inserted on a projection of the front, third joint rounded; arista bare. Face concave in profile, shorter than the front, moderately projecting below. Eyes bare, contiguous in the male. Thorax large and robust, with yellow markings; scutellum in large part yellow. Abdomen more than twice as long as thorax, only a little broader in the middle, flattened, with yellow bands. Legs strong, hind femora elongate, below near outer end with a tooth-like projection. Wings comparatively narrow, marginal cell closed, third vein somewhat bent into first posterior cell; anterior cross-vein beyond the middle of the discal cell, very oblique, the sixth vein beyond the anal cell bent S-like. Type, *M. crabroniformis* Fab., Europe.

The genus *Milesia*, as employed by Latreille, included a large number of heterogeneous forms. St. Fargeau and Serville, in 1825, restricted the genus to include only our present species of *Milesia* and *Spilomyia*, in the sense here used; for the species with unarmed femora and open marginal cell they proposed the name *Temnostoma*. In 1803, a year before the origin of *Milesia*, Meigen had proposed *Spilomyia*, based upon species with armed hind femora and open marginal cell. In 1838, however, he rejected both *Spilomyia* and *Temnostoma*, and included all their species, together with the species with closed marginal cell and toothed femora, under *Milesia*.

Later, Rondani, overlooking the name proposed by Meigen, based *Milesia* upon the very species to which *Spilomyia* had been previously given, and the species with the closed marginal cell he called *Sphixea*, while for the species previously separated by St. Fargeau and Serville as *Temnostoma* he gave the name *Calliprobola*. It may be a question with some whether or not such a division of the heterogeneous genus of Latreille's should not be accepted. But I agree fully with Schiner, who protests against the use of a new name when an older one stands perfectly at our disposal. It is true that none of the species now included in the genus *Milesia* were known to Latreille at the time his genus was named. Fabricius, a year later, changed the name of *Syrphus crabroniformis* Fab. (Entom. Syst., iv, 299) to *Milesia*, and the name was adopted by Latreille in his later work (Gen. Crust., iv, 332). According to the strict canons of modern nomenclature a genus cannot be based upon a species unknown to its author at the time of its erection, but *Milesia* of Latreille can hardly be said to have had any type, and if the name is retained at all it should be given to those species that were first restricted by any author. This was done by St. Fargeau and Serville, they restricting it to four species, two of which had been previously included under *Spilomyia* by Meigen. It seems quite useless and very confusing to retain the name of *Sphixea*, as is done by Bigot.

"Southeastern Asia, and especially the East Indian Archipelago, seems to be the real home of this handsome genus. Thirteen species from the Archipelago have already been described. To these I now add three from the Philippine Islands. One more is known from Japan. From the other parts of the world I know of only two European species, and one North American; a second North American species may be merely a variety. Whether there are some true *Milesiæ* among the South American species referred by authors to that genus I am unable to tell. By all means there are not many." Osten Sacken, Diptera from the Philippine Islands, Berl. Ent. Zeitschr., xxvi, 121.

Milesia ornata. (Plate XII, figs. 2, *2a*, *2b*, *2c*.)

Musca virginiensis Drury, Illustr. Exot. Entom., Appendix II; tab. xxxvii, f. 6, 1773.
Milesia ornata Fabricius, System. Antl., 188, 5, 1805; Wiedemann, Aus. Zw., ii, 106, 4; Macquart, Dipt. Exot., ii, 2, 81, 4; tab. 15, f. 4.
Syrphus trifasciatus Haasmann, Ent. Bemerk., ii, 67, 10; 1799.
Milesia limbipennis Macquart, Dipt. Exot., 4°; Suppl., 147, 8; tab. xiv, f. 3.
Milesia virginiensis Westwood, Drury's Exot. Entom., 2d ed., vol. ii, 77, 1837.
Sphyxea fulvifrons Bigot, Annales Soc. Ent. Fr., 1884, 341.

Habitat.—New England, Illinois, Maryland!, Florida, Texas, Kansas, Guadeloupe (Macq.).

♂, ♀. Length, 18 to 21^{mm}. Face light yellow, thickly covered with similar pollen and pile, shining in the middle, gently concave; cheeks narrow, shining in front, near the orbits with a black spot; antennæ situated below the middle of the head in profile. Frontal triangle in male like the face, vertical triangle black, yellow before the ocelli, long, acute, the eyes contiguous for a short distance near the middle of the space between vertex and base of antennæ. Front in female convergent toward the vertex, yellow, with a black stripe reaching from vertex to base of antennæ. Antennæ light ferruginous. Eyes bare, occiput black, yellow near the mouth, posterior orbits broadly yellow pollinose. Thorax black, but little shining, with a slight greenish reflection, with three broad yellow fasciæ, the first broad, extending across on the anterior margin, sharply interrupted in the middle, the inner hind angles sometimes extending back quite to the next fascia, second band extending across from in front of the root of the wings, interrupted like the preceding; third band on the posterior margin, in front of the scutellum, uninterrupted; scutellum black, broadly yellow on its margin. Pleuræ yellow on the anterior border from the humeri to the base of the anterior coxæ, meso-pleuræ with a vertical and sterno-pleuræ with an oval, nearly contiguous, spot. Abdomen: First segment black; second segment with a broad yellow cross-band, narrowly interrupted and narrowly separated from a reddish-yellow, shining, entire cross-band, which is sinuate on its anterior border, with an angular projection in the middle; third and fourth segments similar; in the third the hind cross-band is broadest in the middle, narrowed at the sides; in the fourth the posterior cross-band forms the larger part of the segment, dilated in front at the middle more sharply than in the preceding; narrow margins of all the segments, except the posterior border of the fourth, black; pile chiefly orange colored, lighter on the yellow bands. Legs yellow, with yellow pile; tarsi and outer part of hind femora more reddish, and the pile intermixed with black. Wings nearly hyaline, especially in the first basal cell, somewhat yellowish or brownish in front, and slightly clouded near the tip.

Eight specimens (Dr. G. Dimmock, Mr. S. Henshaw, Mr. E. Keen).

M. limbipennis Macquart, as figured by Macquart, shows very great differences, in that the marginal cell is open and the third vein nearly straight. Osten Sacken, however, from an examination of the type specimen in Mr. Bigot's collection, believed it to be nothing more than a variety with dark wings. A single specimen from North Carolina (F. P. Atkinson) has the wings very dark brown, almost blackish, in front, the scutellum wholly yellow and the yellow bands of the abdomen separated only by slender black lines.

SPHECOMYIA.*

Sphecomyia Latreille, Fam. Natur. du Regne Animal, 1825; Dict. Classique d'Hist. Nat., xv, 545, 1829.

Tyzenhausia Gorski, Analec. ad Ent. prov. occid. imperii Rossici, 1852, fasc. i, p. 170.

Moderately large species with light yellow markings on head, thorax, and abdomen; the latter with a median and posterior band on segments 2–4. Front very short, horizontal, concave longitudinally. Eyes bare, narrowly separated in the male by the ocellar tubercle. Antennal process moderately prominent. Antennæ longer or shorter than the head. Face perpendicular, obtusely tuberculate, reaching two-thirds of the vertical diameter of the eyes below the orbit, truncate at tip. Abdomen cylindrical. Legs simple. Wings: Marginal cell wide open, third longitudinal vein gently sinuate, small cross-vein oblique, joining the fourth longitudinal vein near outer third of discal cell, last section of fourth vein lightly curved, joining the third near the tip. Type of genus *S. vittata* Wied.

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* Sphex; μυια, fly.

TABLE OF SPECIES.

1.—Antennæ very long, the third joint very short . . . . **vittata**
Antennæ shorter than the head, first two joints very short, the third transversely elliptical 2
2.—Yellow cross-bands of abdomen very broad . . . . **brevicornis**
Yellow abdominal cross-bands narrow . . . . **Pattoni**

Sphecomyia vittata.

Chrysotoxum vittatum Wiedemann, Auss. Zw. Ins., ii, 87.

Psarus ornatus Wiedemann, *ibid.*, 91, 1; tab. ix, fig. 7; Macquart Hist. Nat. Dipt., i, 491.

Sphecomyia vittata Macquart, Dipt., Exot., ii, 2, 18, 1; tab. iii, fig. 3, *id.* Regne Animal, Cuv. xiv; Osten Sacken, Cat. Dipt., 254; V. v. Röder, Ent. Nachrich, 1879, 96.

Tyzenhausia vespiformis Gorski, Analecta ad Entomographium provinciarum occidentalis imperii Rossici, 1852, fasc. i, p. 170–174; tab. 1, fig. 1 (male). (V. v. Röder, l. c).

Sphecomyia vespiformis Wahlberg, Vetensk, Acad. Forhandl., 1854, p. 155; Zetterstedt, Dipt. Scand., xii, 4647; Schiner, Fauna Austr., i, 368.

Habitat.—New England, Southern States, Minnesota! Colorado, Norway, Siberia.

♂, ♀. Length, 11 to 12^{mm}. Black and yellow varied. Front of female black, yellow on the sides below; frontal triangle shining black, except on the sides, continued over the frontal process, and as a conspicuous stripe to the oral margin. Face, light yellow, opaque; cheeks with a broad shining black stripe. Antennæ black, much longer than the head, with short black pile; first and second joints of nearly equal length, third very short, rounded on its end; posterior orbit broadly light yellow, narrower above, and with a fringe of bright yellow pile below; occiput black. Thorax black, nearly opaque, with rather sparse yellowish pile, and yellow spots as follows: a rounded one on each humerus, and two dorsal stripes, abbreviated in front and behind and broadly interrupted in the middle, forming two pairs of elongated spots; a spot on the meso-pleuræ, and one on the sterno-pleuræ, nearly confluent, forming an oval vertical stripe. Scutellum yellow, the rim narrowly black and with black pile. Abdomen shining black, with bright yellow opaque bands; first, second, third, and fourth segments with posterior entire bands; second opaque, with an arcuate band, interrupted and attenuate toward the middle, the outer ends united with the yellow of the posterior margin; third and fourth segments with bands near the middle of the segments, interrupted by a linear space or entire, and expanded at the lateral margins. Legs reddish yellow, coxæ black, the hind ones with a yellow spot, the base of front and middle femora blackish, of the hind femora brownish (in my single female wholly reddish yellow). Wings brownish, lighter towards the posterior part; a dark narrow spot extends from near the tip of auxiliary vein to the base of third posterior cell.

Seven specimens, Connecticut, June, and one from Minnesota (Keen).

Sphecomyia brevicornis.

Sphecomyia brevicornis Osten Sacken, Western Dipt., 341.

Habitat.—Webber Lake, Sierra County, California (O. S.).

"♂. Antennæ black, about half as long as the eye from its upper to its lower corner; they are inserted on a conical, black projection of the front; joints nearly of the same length, the first cylindrical, the second subtriangular, the third rounded, somewhat brownish; arista yellowish. Face and front golden yellow, the former with a black stripe reaching from the antennæ to the mouth; cheeks black; vertex black; posterior orbits golden yellow. Thorax black; humeri, two dorsal lines, interrupted in the middle and not reaching the scutellum, a large spot on the pleuræ and a smaller one under it yellow; scutellum yellow, its posterior edge black, beset with brownish pile; halteres with yellowish knobs. Abdomen yellow; first segment black at base; the second segment has two narrow black cross-bands, the one at the base, the other about the middle; the second does not reach the lateral margins; they are connected in the middle by a black line; the third segment has a narrow black border anteriorly, a small, black, diamond-shaped spot in the middle, and two black streaks on each side between this spot and the lateral margin; the black anterior margin of the fourth segment is entirely concealed under the preceding segment, but a diamond-shaped black spot in the middle and black streaks on the sides are similar to those of the preceding segment; hypopygium yellow. Femora black, except the tip, which is yellowish; the hind femora have the latter half brownish yellow; tibiæ and tarsi brownish yellow; the last two joints of the tarsi black; the end of the third joint brown. Wings tinged with brownish, somewhat yellowish at the base and along the anterior margin; a brownish cloud on the cross-veins. Length, 11 to 12^{mm}."

"This species is very like the well-known *Sphecomyia vittata*, but is smaller, has the first two joints of the antennæ much shorter, and a somewhat different picture of the third and fourth abdominal segments."

Sphecomyia Pattoni. (Plate xii, fig. 8.)

Sphecomyia Pattonii Williston, Proc. Am. Phil. Soc., xx, 328.
Calliprobola calorhina Bigot, Annales Soc. Ent. Fr., 1884, 353.

Habitat.—Washington Territory!

♂, ♀. Length, 13 to 14^{mm}. Front a little longer and more inclined than in *S. vittata*, black in the female, with a rounded yellow spot each side, narrowly separated from the yellow of the face; frontal triangle in the male black in the middle, near the eyes yellow. Eyes of male very narrowly separated. Antennæ reddish brown or blackish, about half as long as the horizontal diameter of the eye, first two joints short, third joint transversely oval, reddish or yellowish near the base below. Face considerably concave on the upper half in the male, less so in the female, with a not very prominent convexity below; light yellow, opaque, with a broad shining black stripe reaching from antennæ to the oral margin; cheeks broadly shining black. Pile of vertex black. Posterior orbits below yellow, with yellow pile, above very narrowly whitish. Thorax shining black, with blackish pile on the dorsum and scutellum; a spot on the humeri, an oval one on the mesopleuræ, and a round one on the sternopleuræ, yellow; scutellum black, yellow at the base Abdomen black, with yellow bands and yellow pile; first, second, third, and fourth segments with rather narrow posterior margins; second segment with an arcuate band, attenuated towards the middle, broadly interrupted and separated from or narrowly connected with the yellow posterior border on the lateral margin; third and fourth segments with a median band, less broadly interrupted, expanded on the lateral margins to connect with the posterior cross-band; fifth segment in the female, with three small subcontiguous black spots; hypopygium black with yellow pollen. Front legs, except extreme tip of femora and base of tibiæ, black, the tarsi somewhat thickened; middle and hind legs yellowish red, blackish toward the base of femora, and the last two joints of the tarsi black. Wings a little brownish, especially along the veins, a brownish cloud at the origin of the third vein and the outer end of the second basal cell.

Two specimens.

CERIA.[*]

Ceria Fabricius, Ent. Syst., 277, 1794.
Sphiximorpha Rondani, Ann. Soc. Ent. de France, ii, 8, 213.

Of medium to large size species, slender, nearly bare, black or dark ferruginous, with yellow bands and spots. Head somewhat flattened, a little broader than the thorax. Antennæ usually inserted upon a long slender process, but the process sometimes short, or even wholly wanting. Antennæ much longer than the head, porrect; first joint long, slender; second and third joints somewhat shorter, of nearly equal length, together forming an elongate oval mass, with a short pointed terminal style. Face below the antennæ not, or only slightly, excavated in profile, vertical, much produced below the eyes, in outline obtuse. Eyes bare, contiguous in the male; vertex angular, projecting. Thorax rather long quadrangular, with yellow spots; scutellum semicircular, wholly, or in part, yellow. Abdomen elongated, cylindrical, more or less narrowed at the base, with yellow bands. Legs moderately strong, hind femora somewhat elongated, tibiæ somewhat thickened toward the end.

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[*] *Κηρια*, a girth.

Marginal cell of the wings open, third longitudinal vein angulated and with a stump of a vein projecting into the first posterior cell; anterior cross-vein beyond the middle of the discal cell, oblique. Tegulæ large. Type of genus, *C. conopsoideus* Linné.

TABLE OF SPECIES.

1.—Antennal process of front not more than half as long as the first joint of antennæ; third longitudinal vein angulated, but scarcely bent into the first posterior cell 2
Antennal process slender, longer than first joint of antennæ; third vein bent deeply into first posterior cell 3
2.—Antennal process almost wholly wanting, first joint of antennæ very slender, nearly as long as the two following together; face vertical, not at all excavated in profile; second segment of the abdomen much constricted, third and fourth segments each with two arcuated spots . . . . . signifera
Antennal process about one-half as long as first joint of antennæ, the latter slender, about three-fourths as long as last two together; abdomen without the side spots on third and fourth segments, the second segment less constricted; wings similar to preceding; the general color more ferruginous . Loewii
3.—Second, third, and fourth segments of abdomen each with two yellow spots, in addition to the bands of the hind margins . . . . pictula
Second, third, and fourth segments without such spots 4
4.—Second segment of abdomen much shorter than the third . . . . abbreviata
Second segment of abdomen nearly as long as the third . . . . . . tridens

Ceria Loewii, n. sp.

Habitat.—Arizona!

♂. Length, 16^{mm}. Face sulphur yellow; from the antennal protuberance a moderately broad ferruginous stripe, white dusted along the middle, where it is the broadest, runs to the oral margin. Cheeks broadly dark ferruginous. From the base of the antennal process a small, indistinct projection, on each side, is directed outwards and downwards. Antennal process short, but little more than one-half as long as the first joint of the antennæ; the latter slender, about three-fourths as long as the two following together; second joint a little shorter than the third, style slender; the color is dark ferruginous. Vertex reddish yellow. Dorsum of thorax brownish black; red on the sides and on the meso and ptero pleuræ; humeri and scutellum yellow. Abdomen: first segment, reddish brown; second segment, rather slender, somewhat longer than the third, with a spot on each side, nearly contiguous, and narrow posterior margin, yellow, elsewhere reddish-brownish black; third and fourth with broader yellow hind margins. Legs reddish yellow. Wings brown on the anterior portion; third longitudinal vein slightly angulated and with a stump of a vein; first posterior cell closed in the border of wing.

Two specimens (H. K. Morrison). This fine, large species I dedicate to the memory of Dr. Loew, to whom the science of American dipterology owes so much.

Ceria abbreviata.

Ceria abbreviata Loew, Centur., v, 48; x, 57, note.

Habitat.—New England, Virginia, Florida!

♂, ♀. Length, 10 to 11^{mm}. Black. Face light yellow with a median black stripe, quite narrow in the male, broader in the female, running from the antennal process to the oral margin; cheeks broadly shining black. Frontal triangle in male yellow, narrowly divided by black in the middle, and separated from the yellow of the face by a black stripe, running from the base of the antennal process to the eyes. Eyes in male touch each other very slightly. Front in female black, with four small rounded spots, two of which are just above the base of the frontal process (sometimes obsolete), and one on each side near the orbit. Antennal process slender, nearly as long as the first two joints of the antennæ together, yellowish towards the base, more brownish on the outer part; first antennal joint but little longer than the second, reddish on basal half, blackish on distal half; second joint black, yellowish at tip; third joint black, scarcely longer than the second; style short. Vertex light yellow, swollen, occiput and orbits on the sides black. Thorax black; humeri, a small spot on side of dorsum, sometimes a vittula above the root of wings, a large vertical meso-pleural, and a smaller, nearly contiguous sterno-pleural spot, and narrow border of scutellum, yellow. Abdomen black; third segment nearly equal in length to the first two; first segment on the sides broadly, second segment with a broad posterior band; third and fourth with narrow posterior bands, yellow. Legs in male chiefly black; base and tip of front femora; base and apical third of middle and hind femora, middle tibiæ and basal half of front and hind tibiæ, and tarsi except the terminal joints, yellowish red; in the female the legs are chiefly reddish, the base of femora, tip of tibiæ, and tip of tarsi, more or less brownish. Wings brown on anterior half, nearly hyaline behind, the costal cell. The brown follows the spurious vein to the small cross-vein and then clouds the posterior border of the third vein to its tip. Third vein strongly angulated and with a stump of a vein.

Three specimens, New Haven, Conn., and one from Virginia (Mr. Theo. Pergande).

Ceria pictula.

Ceria pictula Loew, Neue Beiträge, etc., i, 17.

Habitat.—Southern States (Loew).

♂, ♀. Length, 9^{mm}. Head as in *abbreviata;* the thorax may show an additionally yellow spot on the suture; the abdomen, in addition to the posterior yellow margins, has on the second, third, and fourth segments each two yellow spots; the second segment is longer as in *tridens;* wings and legs similar, or somewhat darker.

The present species has not been recognized since its description in 1853. The description by Loew is as follows: "Ganz von Körperbaue der *Ceria conopsoides* und *vespiformis*, doch noch kleiner als letztere, Auch in der Farbeneinvertheilung ähnelt sie diesen Arten, namentlich der *Ceria conopsoides*, nur dass sie auf dem Thorax und Hinterleibe gelbe Flecken hat, welche jener fehlen. Die Färbung des Kopfs wie bei *C. conopsoides*. Auf dem Thorax findet sich auf der Naht noch zwei gelbe Flecke, welche *C. conopsoides* fehlen; die Spur von zwei andern gelben Flecken findet sich an der Mitte des Vorderrandes. Der Hinterleib hat vom 2ten Ringe an ausser dem gelben Hinterrandssaume je zwei gelbe Flecken. Färbung der Beine noch etwas dunkler, als sie sich gewöhnlich bei *C. conopsoides* findet. Flügelgeäder wie bei *C. conopsoides* und *vespiformis*; die Färbung derselben überall dunkler als bei diesen Arten.”

Ceria signifera.

Ceria signifera Loew, Neue Beitr., i, 18.

Habitat.—Mexico (Lw.), Texas, Florida!

♂. Length, 14^{mm}. Face perpendicular, not at all excavated in outline, yellow with a large yellow sagittate spot in the middle extending narrowly to the oral margin and more narrowly above to the black that surrounds the antennæ, the base of which is yellow, in its middle with a narrow yellow stripe or spot; on either side of the base of the antennæ the black extends out narrowly to the orbit; frontal triangle yellow along the eyes and separated from the yellow of the face by the lateral black projections; cheeks broadly black, with a yellow stripe reaching from the orbit. Frontal process almost wholly obsolete; the immediate ground upon which the antennæ are inserted is yellow; first joint long and slender, a little shorter than the following two together, brownish yellow, darker toward the end, second joint shorter than the third, black, reddish at the tip, third joint black. Occiput black, the orbit dusted with white on the sides, vertex wholly yellow, extending broadly outwards. Thorax black; humeri, a spot on the sides at base of suture, a distinct lateral supra-alar vittula, an elongate meso-pleural, and a sterno-pleural spot immediately below, and nearly all the scutellum, yellow. Abdomen much contracted at base of second segment, black; second, third, and fourth segments with equal yellow fasciæ on the posterior margins; second segment yellow on the sides at the base, with an oval reddish spot on the sides above, toward the base; second segment near the base with an interrupted fascia; third and fourth segments with a U-shaped spot on each side, the convexity behind. Legs wholly yellow. Wings brown in front, more yellowish toward the base; third vein only a little angulated, not bent into the first posterior cell.

♀. Front black, at the base of the antennæ, a spot on each side of the base of the antennæ near the eye, an arcuated transverse, abbreviated band above the base, and the vertex, yellow.

One male specimen from Professor Riley's collection (Florida), and three females in the Loew type collection from Texas (Boll), bearing the label “signifera?” in Loew's writing. I find discrepancies in the original description which make me doubt that this determination is the correct one.

Ceria tridens.

Ceria tridens Loew, Centur., x, 57.

Habitat.—California, Washington Territory!

♂, ♀. Length, 11 to 12^{mm}. Closely related to ***abbreviata***; black, subopaque; face yellow, with a median black stripe, sometimes quite broadly oval, at other times narrow, extending from the base of the antennal process to the mouth; on either side of the base of the antennal process and connected with the facial stripe an oblique stripe runs outward towards the orbit, sometimes reaching it in an attenuated point; cheeks broadly black, sometimes with a slender yellow line; frontal triangle yellow along the border of the eyes, separated in the middle by black; in the female the yellow may extend across the front, just above the antennal process, elsewhere black, the vertex with a yellow oval spot on each side in both sexes, touching the corner of the eye. Antennæ black, joints of nearly equal length; process elongate, about as long as last two joints together; reddish toward the base. Thorax black; humeri, a spot near the outer end of suture, usually a vittula above root of wings, a large oval spot on the meso-pleuræ, a smaller one on the sterno-pleuræ, and a still smaller one on the ptero-pleuræ, all nearly contiguous, and the scutellum in large part, yellow. Abdomen cylindrical, black, finely scrobiculate, the sides of the first segment and the posterior borders of the remainder yellow, the second and third of nearly equal width, broader on the sides, the fourth very broad in the middle, attenuate on the sides, and sometimes with a conspicuous lunate spot on each side of yellowish pollen, hypopygium wholly black. Legs, male: Front and middle femora black, except the base and tip; hind femora black on outer half; all the tibiæ with a brownish ring before tip; intermediate joints of all the tarsi brown, last two of hind tarsi black; legs elsewhere yellow. Female: Yellow, the front femora with a dorsal black streak, the tarsi more ochraceous. Wings brown in front, hyaline behind.

Four specimens. The third abdominal segment in this species is scarcely longer than the second.

Ceria nigripennis, n. sp.

Habitat.—Mexico!

♀. Length, 15 to 16^{mm}. Deep black. Face with two large elongate triangular yellow spots with the apex below; on either side of the base of the antennal process near the eye a small yellowish spot. Antennal process a little longer than the first joint of the antennæ. Humeri, the scutellum wholly, a large spot on the meso-pleuræ, a smaller one behind it and nearly contiguous, and a spot on each side of the metanotum, light yellow. Abdomen only lightly constricted at base of second segment; a spot on each side of the base of second segment, the posterior margin of the same segment narrowly, and of the third segment still more narrowly yellow. Legs wholly black. Wings deep blackish brown, a large triangular space on the outer posterior part, nearly hyaline.

One specimen, in the Osten Sacken collection at Cambridge.

Ceria superba, n. sp.

Habitat.—Mexico!

♂. Length, 19^{mm}. Red. Face red, with four rather narrow, not conspicuous yellow stripes running to the oral margin; on the lower part sub-tuberculate; on each side of the base of the antennal process with a small black spot. Antennal process slender, as long as the two outer joints of the antennæ together. Vertex only moderately swollen. Dorsum of thorax deep red; in front near the middle with the beginning of two yellowish dusted stripes; the humeri, a spot at outer end of the suture, two small spots in front of the scutellum, and a slender supra-alar vittula, yellow; contiguous with each supra-alar vittula on the inner side there is a black abbreviated stripe; scutellum yellow, across the disk slenderly black; an elongated yellow meso-pleural spot bordered with blackish, a spot above the middle coxæ, and a large one on each side of the mesonotum likewise yellow. Abdomen red, brownish toward the end, much constricted at base of second segment; base of second segment and its posterior margin yellow. Legs red; the hind femora blackish above at base. Wings hyaline, reddish along the front margin.

One specimen in the Osten Sacken collection at Cambridge.

Ceria pedicellata, n. sp.

Habitat.—Mexico!

♂. Length, 12^{mm}. Antennal peduncle short, not a third the length of the first joint. Black; antennæ reddish-black, the larger part of the first joint red; first joint very slender, a little longer than the following joint, the third joint about half the length of the second. Face lightly pollinose in the middle and on the sides; vertex, frontal orbits, a small orbital spot on the upper part of the face, and a pair of facial stripes, convergent and narrower below, yellow. Dorsum of thorax scrobiculate; humeri, a small spot on outer end of suture and narrow base and margin of scutellum, yellow; pleuræ wholly black. Abdomen black; base of second segment on the sides, and posterior margin, and the posterior margins of the two following segments more narrowly, yellow; fourth segment with a pair of pollinose arcuate lines; second segment slender, cylindrical, and elongate. Legs reddish-brown, the hind femora, except the base, black, and the front legs more blackish; base of all the tibiæ yellow; hind and middle tarsi brownish-red. Wings brown in front, subhyaline behind.

One specimen (National Museum, Professor Rileys' collection), Isthmus of Tehuantepec (Sumichrast). Is closed allied, apparently, to *C. aristis*, but differs in the face and pleuræ.

Ceria scutellata, n. sp.

Habitat.—Mexico!

♀. Length, 9 to 10^{mm}. Dark reddish black. Peduncle of antennæ short, scarcely a third the length of the first joint; second joint not much longer than the third. Antennæ and peduncle brownish red. Vertex, small orbital spots nearly opposite base of antennæ, and on the sides of the face, a pair of stripes beginning a little below the base of the antennæ and somewhat converging to the oral margin, and two on the cheeks, yellow. Dorsum of thorax black; a small spot on the humeri, a smaller one on the outer end of suture, a slender intra-alar vittula, reaching nearly to the suture, a large trapezoidal spot in front of the scutellum, and the scutellum wholly, yellow. Pleuræ dark red, a median vertical vittula, and a spot on sides of metanotum, yellow. Base of second segment of the abdomen, and its posterior margin, and that of the next segment, yellow; second segment very narrow near the base, but broad behind. Legs dark brownish red. Wings brown in front, nearly hyaline behind.

One specimen, Isthmus of Tehuantepec (National Museum, Professor Riley's collection).

ADDITIONAL NORTH AMERICAN SPECIES.

Ceria nigra.—Mexico.
Sphyximorpha nigra Bigot, Annales Soc. Ent. de Fr., 1883, 317.

Ceria rufibasis.—Mexico.
Sphyximorpha rufibasis Bigot, ibid., 318.

Ceria arietis Loew, Neue Beitr., i, 17.—Mexico.

Ceria Daphnæus Walker, List, etc., iii, 537; Westwood, Trans. Ent. Soc., v, 231, pl. xxiii, fig. 7; Loew, Neue Beitr., i, 18.—Jamaica.

Ceria cacica Walker, Trans. Ent. Soc. N. S., v, 287.—Mexico.

Ceria tricolor Loew, Wien. Ent. Monatschr., v, 37.—Cuba.

PART III.

CONCLUSION.

PART III.—CONCLUSION.

HABITS OF THE SYRPHIDÆ.

In their adult habits the *Syrphidæ* all show a great uniformity. They are flower-flies, and feed upon honey and pollen. They are observed on blossoms of sweet-smelling, melliferous plants, such as the hymenoptera prefer; and patches in bloom of blackberry (*Rubus*), wild cherry (*Prunus*), dogwood (*Cornus*), Canada thistle (*Cirsum*), and elderberry will always be sure to reward the patience of the collector. Some species, as those of *Syritta*, *Sphærophoria*, *Mesograpta*, etc., will be seen wherever there are blossoms. Species of the last, especially, are very abundant about corn-fields when the plants are in blossom, and will frequently alight upon one's hands; these "sweat-flies" are feared by not a few persons, under the belief that they will "sting." All are sunshine-loving, and will rarely be found except in the middle of bright unclouded days. To collect most of the *Syrphini*, *Eristalini*, and following species, one should seek some patch of honey-bearing flowers, such as I have indicated, and patiently stand and watch for their appearance, moving only slowly about. The *Chilosini* will mostly be caught in beating, or in sunshiny, meadowy spots in the woods. Some species, as those of *Xylota*, are found among the foliage of bushes in blossom, and here and there appearing in sight, resting upon some leaf. Species of *Chrysogaster* will be found on flowers in damp places, and are easily captured, their flight being slow. Species of *Neoascia* will be readily overlooked unless especial attention is devoted to them. They live among low bushes and are not usually taken from flowers. Species of *Sphegina*, on the other hand, are found about flowers, especially in elevated regions. Specimens of *Baccha* will rarely be taken when at rest; like most of the slender species they are constantly on the wing, and only now and then rest very lightly upon some sunny leaf or blossom. Owing to their wide distribution a considerable number of species in any one locality will reward long-continued collecting. In a few days, in the first week in August, I obtained forty-seven near the base of Mount Washington, the majority of them from a single patch of elderberry blossoms not a rod in diameter, near the edge of the forest. The bright yellow markings of many lose their freshness after death, and the specimens should never be allowed to be moistened or wetted. The most convenient collecting-bottle that I have used, consists of a plain, wide-mouthed, small bottle, lined throughout with blotting-paper, in the firm cork of which a small cavity is filled with blotting-paper wetted with a solution of cyanide of potash. For a collecting-net I would recommend coarse bobbinet lace, attached to a light wire ring eleven inches in diameter, with a light, rather short handle.

LARVÆ.

The earlier stages and metamorphoses of many of the European species of Syrphidæ are known, and very similar habits and structural peculiarities may be expected from the American species when they shall have been more studied in the larval and pupal conditions. Very few species hitherto have been observed in the United States, and they offer no novelties in the general known habits of the family. The larvæ live usually upon vegetable substances, though some are partly or wholly parasitic upon other insects, especially the Aphidæ, which they serve largely to keep in check. Some are aquatic, living in mud, outhouses, vegetable mold, breathing through the elongate stigmatic tube at the hind end of the body, which they protrude from the substances, when very moist, in which they live. Other species live under bark, on leaves, in the nests of bees, ants, etc.

The larvæ are usually not very elongate, with firm, sometimes tough skin, the head segments small and extensile. Like the other families of the Cyclorrhapha, the larvæ of Syrphidæ do not have a distinctly differentiated head. The external mouth-parts are either wholly wanting, with only a soft fleshy opening, or there are two or four outwardly directed hooklets. There are also short, small, one or two jointed fleshy antennæ. The body is smooth, or provided with soft, conical projections and bristles; below usually with seven pairs of abdominal feet. At the posterior end, the body terminates in a more or less elongate tube, single or double—the stigmata. This sometimes forms a short, almost chitinized, tubercular projection on the dorsal part of the last segment; at other times it is very long, longer than the body, slender, composed of two joints, the one sliding within the other, like the joints of a telescope. It is never divaricate, or forked at the tip, as in many of the other tailed larvæ in the allied families. In changing to the pupal condition the larval skin contracts, as in all of the Cyclorrhapha, to form the pupal envelope, and the body becomes shorter, more oval, and of a darker color, the elongated respiratory type, in the "rat-tailed" species, being curved over the back. At the expiration of the pupal period the anterior end of this envelope is pushed off by the inclosed insect and the perfect fly escapes, soft and moist, but in a very short time in the sunlight to acquire strength and firmness. Unlike all the other Cyclorrhapha, except the Pipunculidæ, however, the frontal lunule in this family does not subserve the usual purpose of springing off this trap or lid to the larva's prison, for it is fused with the front and not inflatable.

This function is that of the inflatable face, and hence it is, this part of the Syrphid anatomy is one of the very best for the furnishing of structural characters in the adult fly.

So far, the larvæ have furnished evidence of only two principal groups in the family. In the one (*Eristalinæ*) the larvæ have no mouth-hooklets, and in general only rudimentary mouth-parts (*Eristalis*, *Mallota*, *Volucella*, *Helophilus*, *Pocota*, *Xylota*, *Orthoneura*); in the other the larvæ are provided with well developed mouth-hooklets (*Syrphus*, *Chilosia*, *Doros*, *Baccha*, *Merodon*, and others). This division coincides fairly well with that based upon adult characters, but a classification drawn from the earlier characters can rarely supersede that founded upon the mature ones, though it may materially modify it. Certainly *Orthoneura* cannot be placed among the *Eristalinæ*, or *Merodon* among the *Syrphinæ* without doing violence to most important and real relationships. Brauer thinks that the larvæ, when they are more studied, will furnish more natural groups in the Syrphidæ, but I do not agree with him, at least to any more than a limited extent. The perfect insect is the most complex, and must offer a greater number and more diverse characters than the simpler stages can present. The use which larval characters subserve the individual or species must first be ascertained before we can learn their true value. It is not at all probable that the possession of mouth-hooklets can materially modify the life-habits of a species when they are present or absent in such related forms as *Chilosia* and *Orthoneura*. To insist upon a classification based upon such characters, would be like insisting upon an equal valuation for the presence or absence of palpi, ocelli, etc. The presence or absence of mouth-hooklets cannot be used to divide the family into principal groups.

The principal genera in which the larval habits are known are the following:

Baccha, *Syrphus*, *Sphærophoria*, *Pipiza*, *Paragus*. Larvæ aphidophagous.

Mallota, *Spilomyia*, *Xylota*, *Brachypalpus*, *Pocota*, *Myiolepta*, *Chrysotoxum*, etc. Larvæ in decaying wood or trees; some of them (*Mallota*) long, "rat-tailed."

Chilosia. Larvæ living in the stems of *Cardium*, *Sonchus*, *Schrophularia*, *Matricaria*, and in fungi (*Boletus edulis*, etc.).

Platychirus, *Rhingia*, *Eristalis*, *Syritta*, *Orthoneura*. Larvæ in decaying vegetable matter, manure, or in soft mud impregnated with decaying vegetable matter.

Brachyopa, *Xylota*, *Chrysochlamys*, *Ceria*. Larvæ found living in flowing sap of trees.

Crioprora. Bred by Osten Sacken, from larvæ found under oak bark.

Microdon. Larvæ common in ants' nests. The larvæ and pupæ of this genus are very curious creatures, resembling some land-shells so much that twice they have been described and named as species of mollusks.

Volucella. The larvæ are parasitic upon humblebees, living in their nests. The very great resemblance of the adult of some species to the bees makes this fact the more interesting.

STRUCTURAL CHARACTERS.

Structural characters in the Syrphidæ are derived from all parts of the body, though those from the thorax are unimportant. The most useful are found in the wing, but a much larger number exist in the head, and are, intrinsically, scarcely less valuable. Next in importance come the various ornamental and functional characters of the legs; while the abdominal ones are superior only to those of the thorax. The following remarks, it will be understood, are based chiefly upon my autoptic knowledge, and such reliable observations and descriptions by other authors as have been accessible to me; they may, in some cases, require modification to express the requirements of exotic genera.

Most excellent structural characters are presented by the antennæ. With proper caution, they are often serviceable in generic distribution, though by far the greater number will only permit of specific employment; some minor variations are sexual, or even individual. Formerly much greater reliance was placed upon the structure of these organs, for generic distinguishment, than our present knowledge will confirm. The basal joint is seldom elongate, and when so, the elongation is rarely pronounced. It may be seen in *Microdon*, *Chrysogaster*, *Criorhina*, *Merapioidus*, *Spilomyia*, *Ceria*, etc., and has only subordinate value, otherwise related species differing materially in this respect. The second joint is more rarely lengthened, extraordinarily in *Sphecomyia*, moderately in species of *Chrysogaster*, *Pipizella*, *Lepromyia*, *Chrysotoxum*, *Microdon*, and *Ceria*. The third joint offers the greatest diversity in form, and the most useful differential antennal characters. In the *Melanostomini*, *Syrphini*, *Sphegini*, and *Brachyopini* it may be oval, but in none of our genera is it distinctly elongate or noticeably widened. In the *Eristalini*, *Sericomyini*, and *Xylotini* it is predominantly dilated, rarely longitudinally oval, never at all elongate. In the *Microdonini* and *Volucellini* it is lengthened; I know of no exception, though in some species of the latter, as *V. obesa*, the elongation is only slight; yet even here the joint is not oval, but pointed. Among the *Chilosini* we find the greatest variableness; in *Pipiza*, *Paragus*, and *Lepromyia*, more or less slender; in *Chrysogaster*, with intermediate forms between marked elongation and orbicular; in the other genera, oval, orbicular, or subquadrate. In the *Milesini* it is always short; in *Sphecomyia*, sp., pointed; in the other genera, transverse. So far as my knowledge reaches, species with elongated antennæ are not very active in their habits, and frequently have pilose eyes.

There seems to be a definite relation existing between the neuration and elongation of the antennæ. Wherever the last section of the fourth vein and the posterior cross-vein show a tendency to a rectangular position, or the inflection of the anterior end, a like tendency toward antennal elongation is usually apparent. Examples of this will be seen in *Microdon*, *Psarus*, *Paragus*, *Pipiza*, *Leprodomyia*, *Chrysogaster*, *Volucella*, etc. The converse, however, is not true.

Moderate or slight plumosity of the arista is of little value in generic distribution. It is disregarded in *Chilosia*, the *Brachyopini*, and *Eristalis*. Abundant plumosity, on the other hand, is of excellent value in the *Volucellini* and *Sericomyini*. In all the other American genera the arista is bare, but among the European genera plumosity also occurs in *Psarus*, *Doros*, and *Spatigaster*. In situation, the arista departs markedly from its usual basal position only in *Pelecocera*, *Nausigaster*, and *Merapioidus*. In some of the long-antennæd *Chilosini* it is more median than basal.

The front frequently affords excellent characters, both generic and specific, in its length, breadth, convexity, wrinkles, grooves, etc. The position and size of the ocelli, in species of *Pyrophæna*, *Sphærophoria*, and *Mesograpta*, are of specific value; otherwise their structure and location are nearly uniform. The projection of the frontal process is extremely great in species of *Ceria*. In the *Xylotini* and *Milesini* its size is usually more noticeable than in the remaining groups, and is greater in the male than in the female; its value is only comparative.

Unlike all the other Diptera cyclorrhapha (except the Pipunculidæ), the supra-antennal lunula is fused with the front, and is not inflatable in the process of extrication from the larval envelope. The face subserves this purpose, and it is here that we find the greatest diversity of structure. With the exception of *Syrphus*, *Eristalis*, and some others, the species in most cases can be distinguished with more or less certainty by the facial profile. The projection of the epistoma finds its greatest development in *Rhingia*, and only a little less in *Crioprora*, *Criorhina*, species of *Volucella*, etc. In most genera there is a more or less pronounced convexity near the middle, or a little below, but is sometimes obsolete or wanting where the epistoma strongly projects or is receding. The face is apt to differ in shape in the two sexes; usually the less convexity or tubercularity is in the female. This will be more especially observed in species of *Chrysogaster* and *Chilosia*, *Myiolepta*, *Pterallastes*, and the more *Milesia*-like forms.

The eyes differ in size and shape very appreciably in different genera, but characters drawn from them are expressed with difficulty, except by the aid of figures. Their hairiness or pilosity is of greater, though always doubtfully generic, value; it may separate species closely allied, as *Syrphus ribesii* and *S. torvus*, and species of *Didea*. The following have more or less occular pilosity: *Microdon* spp., *Chrysotoxum*, *Psilota*, *Pipiza*, *Paragus*, *Chilosia* spp., *Leucozona*, *Catabomba*, *Eristalis* usually, *Volucella* usually, *Copestylum*, *Mallota*, sp. *Doliosyrphus*, and *Chrysochlamys*. It will be noticed that most of the species with an exterior oblique cross-vein have bare eyes. Does their pilosity bear any relation to the habits? Certainly some of the pilose-eyed forms are the less active of the family.

The scutellum presents few structural characters. In *Chrysogaster*, *Pipiza*, and *Chilosia* its thinness may be of generic value. In *Chalcomyia* and *Solenaspis* O. S., its size and width are peculiar. Strangely, both these genera, though widely separated, must present a singular resemblance. In *Microdon* the shape and spines are characteristic. In all the other genera the scutellum is usually hemispherically convex, and but little variable.

In the wing numerous characters appear, in nearly all parts. The shape and termination of the second longitudinal vein, the curvature of the third, the position and shape of the cross-veins, the shape of the sixth longitudinal vein in the Eristaloid genera, and the termination in the Milesoid forms, all form the basis of our classification. In the Syrphoid neuration the veins are usually weak, the wings light and thin; such are mostly adapted to ærial flight and soaring. In the species with inflected veins and more or less elongated antennæ we find the venation usually stouter and the wing heavier, the posterior part unsupported; such species are more sluggish and less active in flight. Finally, speed and strength are united in the *Eristalini*, *Xylotini*, and *Milesini*. The wings here have moderately strong veins, with the outer and posterior portions stronger. *Syritta* differs most in the position of the cross-vein, and its habits are more nearly like the Syrphoid species.

In the abdomen the shape, flattening and elongation offer the greatest diversity, and afford both generic and specific characters, but the former are not easily limited. Some of the smaller, more slender, species are noted for their quick flight, as *Allograpta*, *Sphærophoria*, *Mesograpta*, *Syritta*, etc. Those with a short, thick-set abdomen will usually be found resting upon flowers, and never soaring; those with an oval depressed abdomen, as in *Syrphus*, are the most delicate in their structure, and at the same time very quick and active in flight. The extremes of shape are found in *Baccha*, where it is sometimes extremely slender, or clavate; in *Syrphus*, where it is most depressed; in the *Mallota* group, and *Volucellini*, with the greatest convexity and shortness, and in *Senogaster*, with the remarkable contraction of the median segments. The hypopygium is usually inconspicuous, especially in the *Syrphini*, but in species of *Sphærophoria*, and many of the *Xylotini* and *Eristalini*, it is enlarged and conspicuous. In *Eupeodes* the peculiar development of the two slender processes is remarkable. The structure of *Nausigaster* abdomen is the most peculiar; here the fourth segment is extraordinarily developed and arched, wholly excluding from sight the following segments and inclosing the terminal organs in a deep ventral cavity.

The legs, outside of secondary sexual characters, which will be spoken of further on, do not offer a very great deal of structural differences. They find their greatest slenderness in the *Syrphini*, *Melanostomini*, and here rarely have any thickened parts, and then usually in the feet. In the *Eristalini* and Xylotini they are usually stouter, and very often with the hind femora elongated and thickened. In the *Milesini* the greatest elongation of the legs occurs, in the *Chrysogaster*-like forms the most shortening.

SECONDARY SEXUAL CHARACTERS.

Secondary sexual characters occur with great frequency in this family, and will offer many interesting subjects for future study. They are found in most parts of the body, but, as one would expect, are met with in the greatest diversity and number in the legs.

In the head a difference, constant throughout the family, is found in the eyes. In nearly all the males they are contiguous for a longer or shorter distance between the ocelli and antennæ (holoptic); in a few genera (as *Microdon*, *Chalcomyia*, *Crioprora*, *Triodonta*, *Mallota*, *Helophilus*, etc.) they are more or less widely separated by the front (dichoptic); yet in every case, to the practiced eye, the male can be distinguished with tolerable certainty by the front alone; even when the female is unknown there is never any excuse for confounding the sexes. The male eyes when dichoptic will always present an angularity that is wanting in the other sex, and there is always some narrowing of the front. The female front, though sometimes considerably narrowed, always has the margins straight, without angulation. In a few genera, all holoptic, the males show areas of enlarged facets near the upper portion of the eyes. This enlargement is most noticeable in *Allograpta* and *Catabomba*, but is also indicated in the forms related to *Xylota*. Although I do not know the habits of *Catabomba*, one can safely say that those with this enlargement are disposed to hover motionlessly in the air, and are especially well gifted with rapid flight. The male eye frequently has a greater pilosity than the female, as it is also often larger.

In a number of genera there is a greater development of the lower part of the front in the male, forming a protuberance upon which the antennæ are located. This is most apparent in the genera allied to *Milesia*. There is not much difference in the antennæ. In a number of genera (e. g., *Chrysotoxum*, *Chilosia*, *Brachyopa*, *Volucella*, *Sericomyia*, etc.) the third joint is larger and broader in the female, and in some the arista is less plumose. In the structure of the face the most important variations will be found in *Myiolepta*, where the male is provided with a small, but prominent, tubercle near the middle, which is wanting in the female. Similar differences will be seen in some other genera, as in species of *Chilosia*, *Chrysogaster*, and *Pterallastes*. The other differences between the sexes have already been adverted to. In the mouth organs I have observed but slight sexual differences; in some few genera, as in *Criorhina* spp., the female proboscis is longer than that of the males.

In the thorax I know of no structural sexual differences; nor, so far as I am aware, do any such exist in the wings.

In the abdomen, in addition to the primary characters, no differences of importance present themselves. The shape in the male is frequently more slender, and with greater convexity above. In all those genera (*Ceria*, *Baccha*, *Sphegina*, etc.) where the abdomen is clubbed this character is more pronounced in the male. In the genera allied to *Mallota* the male abdomen is found more cylindrical toward the end.

The most important sexual characters are in the male legs, and probably subserve some purpose in the sexual relations, although such must often be difficult to understand, where otherwise closely allied species differ markedly in their presence or absence. In the front pair, *Platychirus* and *Pyrophæna ocymi* are the only ones known to me where structural differences are seen, the tibiæ and tarsi being more or less dilated in the male, and the same sex sometimes provided with femoral bristles. Differences in the middle pair are confined to *Pyrophæna ocymi* and some species of *Platychirus*, where likewise may occur a dilatation of the tarsi and structural peculiarities of the tibiæ. When we come to the hind pair the most numerous and striking plastic differences present themselves. In the coxæ there is sometimes a more or less prominent spur or process on the inner hind side in the male. In *Pipiza* (*Cnemodon*) this may be long and slender, but usually it is conical, as will be observed in *Triodonta*, *Xylota* sp., etc. In the femora, wherever there is thickening it is usually more pronounced in the male, as in *Mesograpta* sp., and genera of the *Eristalini* and *Xylotini*. In some of these, as for instance *Mesograpta geminata* and *Mallota*, the male femora are, in addition, more arcuate, sometimes very much so. In not a few genera the male is provided with one or more projections on the under side of the thickened femora. (In *Milesia* and *Spilomyia* (♀ , ♂) there is a conical projection near the outer end. In *Senogaster* it is flattened and bifid; in others it takes the shape of an angular projection, most prominent in *Tropidia*. In some genera (♀ , ♂) (as *Xylota*, *Brachypalpus*, *Brachyopa*, and especially *Syritta*) there is a row of spines or short bristles on the under side; in *Lepromyia* and species of *Myiolepta* this character is found below all the femora, which are also all thickened). In only one case (*Tropidia mamillata*) do I know of a long and cylindrical process near the basal end of the femur. In the hind tibiæ there are also differences. The most common are greater curvature and compression, especially in those cases where the femora are thickened. An excellent example will be found in species of *Mallota*. In some, as in *Spatigaster*, etc., the bending may be sharp, almost angular; in others the tibiæ are provided with more bushy and long pile in the male. In *Helophilus* spp., *Eristalis* spp., *Xylota* spp., *Triodonta*, and other genera, the tibiæ (♂) are provided with a more pronounced spur at the tip. In *Mallota* sp. and *Teuchocnemis* there is, in addition to the flattened tibiæ, a strong projecting spur in the middle in front, which lies on the inner side of the femora when flexed. In *Brachypalpus frontosus*, and in certain exotic genera, there is a smaller projection near the base of the tibiæ. In the hind tarsi the only sexual character with which I am acquainted consists in a thickening and elongation of the hind metatarsi. This peculiarity finds its greatest and remarkable development in *Microdon* (*Ubristes*), but is also seen in many of the *Chilosini* and *Melanostomini;* rarely if at all in the *Eristalini* and following groups.

In coloration and pilosity by far the greater number of species offer distinct differences. The most striking example of this is seen in *Triodonta curvipes*, where the male abdomen is red and the female black; singularly the hind legs in this species offer more sexual peculiarities than in any other. In some species with banded abdomen the yellow markings show a greater tendency to confluence in the female. In many the markings of the abdomen are more conspicuous in the male, or obsolete in the female; species of *Eristalis* and *Helophilus* will be recalled as examples. Again, in the male there is sometimes a tendency to melanism, in the antennæ (e. g., *Chilosia*), the legs (*Syrphus*), face (ibid.), coloration of the abdomen (*Chilosia*, *Sphegina*), and thorax (*Helophilus*). As a general rule the male coloration is more strongly indicated; such we know is in conformity with the general zoological law, that the male shows the greater number of ornamentations, both in color and structure. In the male the pile throughout is frequently longer, more abundant, and sometimes darker in color.

None of the foregoing sexual differences appear to be characteristic of the family. Thus, holoptic males are predominant throughout the order; differences in the size of the antennæ may be met with in the *Muscidæ*, etc.; similar or allied structural variations in the legs, in the *Tachinidæ*, *Dolichopodidæ*, *Midasidæ*, *Asilidæ*, etc.; of the abdomen in *Stratiomyidæ*, etc. On the other hand, sexual differences in the wings, as in the *Asilidæ*, and certain ornamentations of the legs, as in *Asilidæ*, *Tachinidæ*, *Dolichopodidæ*, *Empidæ*, etc., do not occur here.

What is the purpose of these sexual peculiarities? This is a question easily asked, but far less readily answered. Only this may be said: their use in general does not appear to be commensurate with their oftentimes striking development. Species, otherwise closely allied, sometimes show remarkable differences in this respect. Thus, *Helophilus distinctus* and *H. chrysostomus* are so closely related that they apparently have been hitherto confounded, yet in the former the male hind coxæ bear a strong spur, wanting in the latter. Very closely allied species of *Xylota* show the same peculiarity. *Tropidia mamillata*, notwithstanding the well-developed basal femoral process, does not differ much from *T. quadrata*. The same may be said of *T. calcarata*, with its coxal spur. *Mesograpta geminata* and *M. parvula* are closely allied, yet in the former the male hind femora are thickened and arcuated. The terminal tibial spur in *Helophilus*, *Xylota*, etc., is very uncertain in its appearance, while the internal median spur in *Mallota cimbiciformis* appears only to be a dimorphic peculiarity. Similar dimorphism apparently exists in such species as *Sepedon armatus* and *S. pusillus*, for instance, in the *Sciomyzidæ*. There certainly, however, seems to be a functional purpose for these structural developments; the only thing surprising is that their possession so often appears to have no effect upon other characters. We can readily imagine that the processes and strengthening of the hind legs may be employed in the seizing and retention of the female, but why have these acquired peculiarities not had a greater result upon the species?

Another question, important to all systematic entomologists, arises from their discussion. Are secondary sexual characters serviceable as generic characters? Contrary to the opinion of many students, I hold that they are. It may strike one as absurd that the sexes may be located under different genera, but we must bear in mind that a species is composed of *both* sexes, and it is by the totality of characters that a genus is bounded. But such characters can not be indiscriminately used. Single differences of any kind are suspicious when not accompanied by others, and sexual characters should be avoided as far as possible when both sexes cannot be defined. Among the *Dolichopodidæ*, so rich in male characters, species as zoological entities rest chiefly in the male; the female is a reproducing organ, like the spermiferous barnacle. Classification is made no more difficult by the use of such characters, and is sometimes much simplified; besides it may bring related forms together; and is not this the real end of scientific classification?

GEOGRAPHICAL DISTRIBUTION.

In their geographical distribution, at least so far as the North American fauna is concerned, the *Syrphidæ* present no remarkable facts, though not a few of interest. The most noteworthy one is the wide distribution, in general, of genera and species. We have very few peculiar genera, and fewer still are aberrant from well-known types, *Nausigaster* being, perhaps, the most worthy of note in this respect. Forty-two genera are common to Europe and North America, and nearly thirty of our species are known to be common to the two continents, and it is very probable that this number will be increased by not a few. *Nausigaster* is so far known only from North America, but it will undoubtedly be found to occur in South America. *Mesograpta* is a peculiarly American genus; indeed, it may properly be called the characteristic genus of our fauna, not only on account of its restriction to this continent, but by reason of the large number of species and the multitude of individuals. Mr. Bigot, it is true, has described species of *Mesograpta* from New Caledonia, but it may most safely be said that his determinations are wrong. *Asarkina*, from Africa, is its nearest extra-American representative. *Copestylum*, though not differing very markedly from *Volucella*, may also be considered an American type. *Pterallastes*, *Teuchocnemis*, and *Triodonta*, though so far known to include only North American species, are feebly characterized, and can hardly be taken into account as distinctive American types. Nor is *Crioprora* a much better example, some of the European *Brachypalpi* approaching it closely. *Eupeodes*, *Merapioidus*, and *Senogaster*, on the other hand, are well differentiated American forms.

A comparison of the European and North American genera will be of interest, though in general only confirming certain laws of distribution that have long been established in other branches of systematic biology. I mean the greater resemblance between the Pacific and European faunas than between the Atlantic and European. Of course we can yet only speak *ab uno disce omnes*. The Western fauna is not yet by any means well known, but what is known is sufficient for the purpose. Thus, the genus *Chilosia*, containing nearly one hundred European species, is very sparingly represented in the Eastern States, but seems to be rich in the West, and that, too, in European forms (hairy-eyed) not yet discovered east of the mountains. Nearly the same may be said of *Sphærophoria*, *Melanostoma*, and *Platychirus*. *Syrphus*, so abundant in Europe, has so far five species peculiar to the East, ten to the West, and eight in common. *Arctophila*, *Pocota*, and certain species, occur only in Europe and Western America. The rule has been so often confirmed that it may be accepted without hesitation, I think, viz: that Eastern American species, identical with European ones; have usually a distribution across the continent. On the other hand, the example of *Catabomba pyrastri*, an European species found in great abundance in the Western but not in the Eastern region, is a fact bearing in the same direction. To this last species I think we may safely add *Eristalis tenax* as being primarily Western, but which, during late years, has been distributed from the West eastward. I have no explanation to give of how the European species have reached the Western region, if they are not in reality indigenous there, whether by way of the Atlantic States, or whether the species common to the two sides of the continents have traveled from West to East; but I certainly think in some cases, such as that of *Eristalis tenax*, it has been the latter way.

Of all the numerous species common to Europe and America, very few are confined, so far as we know, to the Eastern States, and every new examination of Western material subtracts from the number. The larger number, so far, of those genera peculiar to America are found in the East, and nearly all the American genera common to Europe are found in the West. Exceptions to this are seen in *Eupeodes*, *Pelecocera*, *Somula*, and especially *Rhingia*, etc. Again, such genera as *Microdon*, *Xanthogramma*, *Ceria*, etc., seem to indicate that those genera with few species in Europe are best represented in the Eastern States; but the facts will allow us to predicate but little here.

In speaking of the Western fauna, I refer especially to the region limited by climatic conditions, and not extending further east than Western Nebraska, Middle Kansas, and Texas. From several years' active collecting in Western Kansas, I long ago recognized the almost sharp limitation of species. In some cases, especially among Coleoptera, the eastern lines of habitat could be traced almost as clearly as the floral habitats on the mountain side.

Yet another fact of great interest is the entire absence of several large European genera in our fauna—*Eumerus* and *Merodon* especially. It is very doubtful whether the former will ever be found in the United States, particularly the Eastern ones.

I have endeavored to sum up our knowledge of the geographical distribution in the following table. It will, of course, be understood that the data of the occurrence of genera (in their modern signification) in Asia, Africa, and South America are yet meager, but I have given such as I have been able to obtain. The occurrence of genera is indicated by asterisks, which are replaced by figures when species are known to be common.

Tabular synopsis and geographical distribution of genera.

Genera.	Whole number of species.	Eastern species.	Western species.	Common.	Common to Europe.	Asia.	Africa.	South America.	Number of European species.
Microdon	12	8	2	2	*	*	*	*	3
Chrysotoxum	6	3	3	......	*	*	*	*	12
Paragus	4	2	*	2	2	*	*	*	10
Nausigaster	1	......	1	......	......	......	......	......	......
Pipiza	14	14	*	......	1	?	*	*	50
Psilota	1	1	......	......	*	......	......	......	[illegible]
Chrysogaster	8	4	4	......	*	*	......	1	31
Chilosia	14	3	9	2	*	*	*	*	[illegible]
Melanostoma	12	1	10	1	1	*	?	1	35
Pyrophæna	2	1	*	1	2	......	......	......	[illegible]
Platychirus	5	1	2	2	1	*	*	*	19
Leucozona	1	*	*	1	1	......	......	......	[illegible]
Catabomba	1	......	1	......	1	......	1	1	1
Eupeodes	1	......	1	......	......	......	......	......	......
Syrphus	23	5	10	8	5	*	*	*	[illegible]
Didea	2	1	*	1	......	......	......	......	[illegible]
Xanthogramma	5	4	*	1	......	*	*	......	[illegible]
Allograpta	2	*	1	1	......	......	......	1	......
Mesograpta	5	2	*	3	......	......	......	*	......
Sphærophoria	8	6	1	1	1	*	*	*	[illegible]
Pelecocera	1	1	......	......	*	*	......	......	[illegible]
Neoascia	2	1	1	......	*	*	......	......	11
Sphegina	4	1	1	2	*	*	......	......	[illegible]
Baccha	10	5	3	2	1	*	*	*	[illegible]
Chalcomyia	1	1	......	......	......	......	......	......	......
Myiolepta	4	1	1	2	*	......	*	*	[illegible]
Rhingia	1	1	......	......	*	......	*	*	[illegible]
Eugeniamyia	1	*	*	1	1	......	......	......	[illegible]
Brachyopa	3	*	1	2	*	......	......	......	[illegible]
Volucella	18	4	10	4	*	*	*	*	[illegible]
Copestylum	1	......	1	......	......	......	......	*	......
Sericomyia	6	4	1	1	1	*	......	......	[illegible]
Arctophila	1	......	1	......	*	......	......	......	[illegible]
Eristalis	20	9	7	4	2	3	1	3	[illegible]
Doliosyrphus	1	......	1	......	*	......	......	*	......
Pteroptila	1	*	*	1	......	......	*	*	......
Helophilus	19	12	5	2	*	*	*	*	18
Pterallastes	1	1	......	......	......	......	......	......	......
Teuchocnemis	2	2	......	......	......	......	......	......	......
Mallota	3	2	1	......	1	*	......	*	5
Triodonta	1	*	*	1	......	......	......	......	......
Tropidia	3	2	*	1	*	......	......	*	[illegible]
Criorhina	12	8	4	......	*	?	?	*	11
Crioprora	4	*	3	1	......	......	......	......	......
Pocota	1	......	1	......	*	......	......	......	1
Brachypalpus	6	4	2	......	*	......	......	......	5
Xylota	21	8	9	4	2	*	*	*	13
Senogaster	1	1	......	......	......	......	......	*	......
Syritta	1	*	*	1	1	1	1	1	[illegible]
Chrysochlamys	4	3	1	......	*	......	......	?	4
Merapioidus	1	1	......	......	......	......	......	......	......
Spilomyia	6	4	2	......	*	......	......	......	[illegible]
Temnostoma	6	6	......	......	1	......	......	......	[illegible]
Milesia	1	1	......	......	*	*	......	......	[illegible]
Sphecomyia	3	1	2	......	1	*	......	......	1
Ceria	6	2	3	1	*	*	*	*	6
Total	304	142	106	56	27	......	......	......	......

GEOLOGICAL DISTRIBUTION.

Through the courtesy of Mr. Scudder, I was enabled to examine his collection of specimens, and the drawings for his forthcoming work on fossil insects, in this family. The specimens are, many of them, in a truly remarkable state of preservation, admitting frequently of definite and decided opinions as to their relations. Of the thirty or more species which Mr. Scudder had separated out, I was first struck with the fact that probably all belong to the first division of the family with a basal cross-vein, a conclusion at which Mr. Scudder had already, independently, arrived. There are two possible exceptions, but both, in view of the general relations of the other specimens, doubtful. The first was the specimen which Mr. Scudder had doubtfully referred to *Eristalis* (Bull. U. S. Geol. Surv., iii, 756). As regards this, however, I think that the problematic determination is not the correct one. The other specimen—named *Milesia quadrata* (Bull. U. S. Geol. Surv., iv, 752)—I would, contrary to the opinion first held by me, remove from this group. The neuration is, in large part, conjectural, and in all probability has, as Mr. Scudder described, a basal cross-vein, removing it from *Milesia* and its congeners. The species is unusually large for a *Syrphus*, but yet its affinities are evidently with that genus.

The next most striking point observed was the predominance of the *Syrphus* forms. The large number of the species, as well as specimens, belong to this genus in apparently a narrow sense, and many of them are peculiarly characteristic. Singularly, all of them appeared to have the abdominal cross-bands interrupted or emarginated. In none did I find entire bands as in *S. ribesii* or *Lesueurii*. Not a few had the picture very like that of *Didea laxa*. The neuration in all showed much uniformity. The anterior cross-vein is basal and only rarely with any marked degree of obliquity. In the larger number the third vein is straight, or anteriorly convex, but occasionally gently sinuous, as in *Catatomba pyrastri*, for instance. A very noticeable tendency was observed in the termination of the third vein near or beyond the tip of the wing, as in *Rhingia* and some species of *Chilosia*.

Chrysogaster was identified with considerable certainty in specimen No. 12621. The profile of the head, moderately elongate antennæ, size, metallic coloration, apparent punctulation, and what seemed evidently rugose markings on the front, are all strongly characteristic. The neuration is, however, more like that of *Syrphus* or *Chilosia* than that of the typical *Chrysogaster;* nevertheless I should feel little hesitancy in placing the species in the genus in the sense accepted for our American species. Another species (specimen No. 5102) is very characteristic of *Sphegina*, although the structure of the head could not be made out. The size, thickened hind femora, provided with spines below, and the elongate spatulate shape of the abdomen, were especially striking. The neuration, so far as could be made out, is *Sphegina*-like.

Numerous specimens of *Chilosia* have been determined, some of them with certainty, by the facial profile, antennæ, coloration, neuration, shape of abdomen, and structure of legs. Perhaps the most characteristic is specimen No. 8781, which lies upon the side, giving an excellent profile of the head. Other specimens seemed to approach *Pipiza* or *Psilota*, though one could not say with absolute certainty that these genera, in their modern acceptation, actually occur among them, though I very much think that one or both do.

Rhingia seemed to be recognizable with sufficient certainty, the determination based upon coloration, shape of abdomen, large wings and almost typical neuration, and slender legs, especially well shown in specimen No. 11099.

It may safely be said that *Syrphus*, *Chilosia*, *Chrysogaster*, *Rhingia*, and *Sphegina* occur in the American Tertiary beds, to which may in all probability be added *Pipiza*. There is yet another form which could not be located in any of the known existing North American genera with certainty. The specimen (No. 7035) is of large size, in shape much like that of *Mallota*, the hind femora apparently much thickened, the antennæ rounded, the penultimate section of the fourth vein long, and the anterior cross-vein basal and rectangular. The form is nearest allied to *Myiolepta*.

In conclusion, I cannot refrain from expressing my admiration of the perfection and accuracy of the dipterological drawings, and the care with which the specimens have been studied by Mr. Scudder. Mr. Scudder has given a summary of our present knowledge of insect paleontology in Professor Zittel's Handbuch der Paleontologie, from which the following is given to complete the present status of our paleontological knowledge of this family:

"A very obscure object from Solenhofen is referred by Weyenbergh to *Chilosia*, and Giebel refers to a new genus, *Remelia*, a minute fly figured by Brodie from the English Purbeck, but its reference here is very doubtful.

"In the Tertiaries this family is more abundant and varied than any of the other families of *Diptera cyclorrhapha*. Burmeister and Terres both recognize *Microdon* at Aix, *Pipiza* has been described from Rott, *Chilosia* from Wyoming, and seven species of *Syrphus* from Oeningen, Radoboj, Rott, and Senegaglis, besides which it has been recognized in amber; in amber, also, are found two peculiar genera allied to *Ascia* and *Xylota*, besides *Chilosia*, *Volucella*, and *Criorhina*; *Rhingia* is noticed at Aix, *Eristalis* described from Utah, *Helophilus* and *Merodon* from the Rhine, and *Milesia* from Wyoming. Lastly some thirty or more species of various genera occur at Florissant, and a considerable number of them in a remarkable preservation.

"There are descriptions of *Pipiza*, *Syrphus*, *Merodon*, and *Helophilus*."

The American fossil species already described are the following:

Eristalis lapideus Scudder, Bull. U. S. Geol. Surv., iii, 756.

Based upon an imperfect specimen, and, as before stated, probably not belonging to this genus.

Milesia quadrata Scudder, Bull. U. S. Geol. Surv., iv, 752.

Probably not a *Milesia*; see remarks on previous page.

Chilosia ampla Scudder, Bull. U. S. Geol. Surv., iv, 753.

Most probably a true *Chilosia*.

CHRONOLOGICAL LIST OF GENERA.

In the following list I have endeavored to give all the generic names hitherto proposed in the family of *Syrphidæ*, arranged chronologically. Such names as I believe to be well founded, or which I cannot find any reliable data as to their synonymy, are printed in heavy type, in order to distinguish them from those which are believed to be synonymous. The latter, printed in italics, it will be observed, are preceded by numbers indicating their synonymy. Undoubtedly from among the former others will yet be shown to be synonyms, and from the latter not a few may be finally accepted as subgeneric, or as applying to species sufficiently distinct to justify their use. I have given, in brackets, such of the various spellings as I have been able to find. The habitats given are of the type species.

1763.

1.—**Rhingia** [*Rhyngia*] Scopoli, Entom. Carniol., 358. Europe.

1764.

2.—**Volucella** Geoffroy, Hist. des insectes des environs de Paris, ii.

1775.

3.—**Syrphus** Fabricius, Syst. Entom., 762. Europe.

1794.

4.—**Ceria** Fabricius (non Scopoli, 1763), Entom. Syst., iv, 277. Europe.

1801.

2.—*Cenogaster* Duméril, Expos. et dict. d'hist. nat. Europe.

1803.

5.—**Chrysotoxum** Meigen, in Illiger's Mag., ii, 259. Europe.
6.—**Spilomya** [*Spilomyia, Spylomya*] Meigen, ibid., 273. Europe.
23.—*Heliophilus* Meigen, ibid., ii, 273. Europe.
7.—**Chrysogaster** Meigen, ibid., 274. Europe.
8.—**Doros** Meigen, ibid., 274. Europe.
9.—**Sericomya** [*myia, myza*] Meigen, ibid., 274. Europe.
10.—**Elophilus** [*Helophilus*] Meigen, ibid., 274. Europe.
11.—**Merodon** Meigen, ibid., 274. Europe.
12.—**Microdon** Meigen, ibid., 275. Europe.
2.—*Pterocera* Meigen, ibid. Europe.

1804.

13.—**Psarus** Latreille, Hist. nat. Crust et Ins., xiv, 357. Europe.
12.—*Aphritis* Latreille, ibid., 358. Europe.
14.—**Paragus** Latreille, ibid., 359. Europe.
15.—**Milesia** Latreille, ibid., 361. Europe.
16.—**Eristalis** Latreille, ibid., 363. Europe.

1805.

17.—**Baccha** [*Bacha*] Fabricius, Syst. Antl., 199. Europe.
3.—*Scæva* Fabricius, ibid. Europe.

1806.

18.—**Callicera** Panzer, Fauna Germ., civ. Europe.

1816.

19.—**Pipiza** Fallen, Dipt. suec., Syrph., 58. Europe.

1820.

20.—**Graptomyza** Wiedemann, Nov. Dipt.

1822.

107.—*Ascia* Meigen (non Scopoli, 1777), Syst. Beschr., iii, 185. Europe.
21.—**Sphegina** [*Sphægina*] Meigen, ibid., 193. Europe.
22.—**Eumeros** [*us*] Meigen, ibid., 202. Europe.
23.—**Xylota** Meigen, ibid., 211. Europe.
24.—**Psilota** Meigen, ibid., 256. Europe.
25.—**Brachyopa** Meigen, ibid., 260. Europe.
26.—**Cheilosia** [*Chilosia*] Meigen, ibid., 296. Europe.
27.—**Pelecocera** [*Pelocera*] Meigen, ibid., 340. Europe.
28.—**Tropidia** Meigen, ibid., 346. Europe.
29.—**Mallota** Meigen, ibid., 377. Europe.

1824.

12.—*Ceratophya* [*Cerathophya*, *phyia*] Wiedemann, Analect. Entom., 14. South America.

1825.

2.—*Ornidia* St. Fargeau and Serville, Encycl. méth., x. Europe.
30.—**Platycheirus** [*Platychirus*] St. Fargeau and Serville, ibid., 513. Europe.
31.—**Pocota** [*Plocota*] St. Fargeau and Serville, ibid., 518. Europe.
32.—**Sphærophoria** [*Spœraphoria*] St. Fargeau and Serville, ibid., 513. Europe.
33.—**Syritta** [*Siritta*] St. Fargeau and Serville, ibid., 808. Europe.
2.—*Temnocera* St. Fargeau and Serville, ibid., 786.
34.—**Temnostoma** St. Fargeau and Serville, ibid., 518. Europe.
35.—**Sphecomyia** [*Sphæcomyia*, *Sphegomyia*, *Specomyia*] Latreille, Fam. natur. du Règne Animal. North America.

1830.

36.—**Platynochætus** [*etus*, *œtus*] Wiedemann, Auss. zw. Ins., ii, 147. Europe.

1834.

6.—*Mixtemyia* [*Mixomyia*, *Myxtemyia*] Macquart, Hist. nat. dipt., i, 491. North America.
37.—**Criorhina** [*Criorrhina*, *Chryorhina*, *Chriorhyna*, *Criorhyna*] Macquart, ibid., 497. Europe.
12.—*Chymophila* Macquart, ibid., 486.
38.—**Didea** Macquart, ibid., 508. Europe.
16.—*Priomerus* Macquart, ibid., 511.
39.—**Senogaster** [*Stenogaster*] Macquart, ibid., 519. South America.
40.—**Brachypalpus** Macquart, ibid., 523. Europe.
41.—**Ocyptamus** Macquart, ibid., 554. North America.
7.—*Orthoneura* Macquart, ibid., 563. North America.
Palpada Macquart, ibid.

1838.

12.—*Dimeraspis* Newman, Entom. Mag., v, 372.
42.—**Myolepta** [*Myiolepta*] Newman, Entom. Mag., v, 373.
38.—*Enica* Meigen, Syst. Beschr. europ. zw. Ins., vii, 140. Europe.
23.—*Micraptoma* Westwood, Introd. Class Ins., i.

1840.

33.—*Coprina* Zetterstedt, Ins. Lapp. Europe.

43.—**Triglyphus** [*Triglyptus*] Loew, Oken's Isis, 565. Europe.
32.—*Melithreptus* [*Melitreptus*] Loew (non Veill.), ibid., 577. Europe.

1842.

44.—**Mixogaster** Macquart, Dipt. exot., ii, 2, 14. South America.
45.—**Megaspis** Macquart, ibid., 27. Eastern Asia.
76.—*Plagiocera* Macquart (non Klug, 1834), ibid., 59. North America.
46.—**Dolichogyna** Macquart, 65, ibid. Chili.
29.—*Imatisma* Macquart, ibid., 67. North America, India.
47.—**Asarkina** [*Asarcina*] Macquart, ibid., 77. Africa.

1843.

48.—**Sparigaster** [*Spatigaster, Spathiogaster, Spathegaster, Sphathigaster, Spasiogaster, Spazogaster*] Rondani, Esam. d. var. sp. Ditt. Brasil., Rev. Entom.

1844.

58.—*Ferdinandea* [*œa, ia*] Rondani, Ann. Sc. Nat. di Bologna (2) ii, 195.

1846.

49.—**Copestylum** Macquart, Dipt. exot., 1^er^ Suppl., 124. Central America.

1847.

50.—**Somula** Macquart, Dipt. exot., 2^e^ Suppl., 56. North America.

1848.

51.—**Phalacromya** [*myia*] Rondani, Esam. d. var. sp. Ditt. Brasil.

1849.

52.—**Meromacrus** Rondani, Stud. Entom.

1850.

53.—**Dolichomerus** Macquart, Dipt. exot., 4^e^ Suppl., 131. Asia.
54.—**Senaspis** [*Stenaspis*] Macquart, ibid., 133. Africa.
55.—**Orthoprosopa** Macquart, ibid., 4^e^ Suppl., 143. Tasmania.
104.—*Polydonta* Macquart (non Fischer, 1807), ibid., 144. North America.
56.—**Coiloprosopa** (*Coilometopa*) Macquart, ibid., 145. Tasmania.
Plesia Macquart (non Jur., 1807; nec Klug, 1833), ibid., 156. New Zealand.
57.—**Hemilampra** (*Misolampra*) Macquart, ibid., 159. Tasmania.
4.—*Sphiximorpha* [*Sphyximorpha, Sphixiomorpha, Spiximorpha*] Rondani, Ann. Soc. Ent. de France. Europe.

1851.

58.—**Chrysochlamis** [*Chrysochlamys, Chrysoclamys*] (Rondani) Walker, Ins. Brit., i, 279. Europe.

1852.

35.—*Tyzenhausia* [*zia*] Gorski, Annal. ad Ent. prov. Rossici, 170. Europe.

1855.

84.—*Toxomerus* Macquart, Dipt. exot., 5^e^ Suppl., 92. North America.

1856.

29.—*Zetterstedtia* Rondani, Dipt. Ital. Prodr., i, 44. Europe.
15.—*Sphixæa* [*Sphixea, Sphyxea, Sphizæa, Sphyxæa*] Rondani, ibid., 46. Europe.
59.—**Caliprobola** [*Calliprobola*] Rondani, ibid., 47. Europe.
3.—*Lasiophticus* Rondani, ibid., 51. Europe.
19.—*Heringia* [*Heryngia*] Rondani, ibid., 53. Europe.
10.—*Myathropa* [*Myatropa, Myiatropa*] Rondani, ibid. Europe.
3.—*Epistrophe* [*us*] Walker, Ins. Saunders, 242. North America.
12.—*Ubristes* Walker, ibid., 217. Brazil.
82.—*Amathia* Walker (non Lam., nec Roux, nec Dup.), ibid., 223. Brasil.
60.—**Citibæna** Walker, ibid.
61.—**Deineches** Walker, ibid., 227.
62.—**Baryterocera** Walker, ibid.

1857.

63.—**Lejops** [*Liops*] Rondani, Dipt. Ital. Prodr., ii, 33, note. Europe.
42.—*Xylotæja* Rondani, ibid., 96. Europe.

64.—**Mesembrius** Rondani, ibid., 50, note. Europe.
19.—*Pipizella* Rondani, ibid., 185. Europe.
65.—**Simoides** Lœw, Dipt. Südafrikas. Africa.
7.—*Campyneura* [*Campineura, Camptoneura*], Rondani, ibid.
66.—**Rhoga** Walker, Trans. Ent. Soc. Lond.
67.—**Lycastris** Walker, ibid.
16.—*Eristalinus* Rondani, ibid., 40. Europe.
16.—*Eristalomya* [*myia*] Rondani, ibid., 40. Europe.
Melanogaster Rondani, ibid., 166. Europe.
Lejogaster Rondani, ibid., 166. Europe.
Lejota [*Liota*] Rondani, ibid.

1858.

37.—*Dasymyia* Egger, Verh. zool.-bot. Gesellsch.

1859.

7.—*Cryptineura* [*Cryptoneura*] Bigot, Rev. et Mag. Zool., 307. North America.
67.—*Lycastrirhyncha*, Bigot, ibid., 307. South America.
68.—**Cyphipelta** Bigot, ibid., 307; Röder, Wien. ent. Zeit., i, 61. Australia.

1860.

69.—**Melanostoma** Schiner, Wien. ent. Monatschr., iv, 213. Europe.
70.—**Pyrophæna** Schiner, ibid., 213. Europe.
71.—**Eriozona** Schiner, ibid, 214. Europe.
72.—**Leucozona** Schiner, 214. Europe.
73.—**Arctophila** Schiner, ibid., 215. Europe.
74.—**Xanthogramma** Schiner, ibid., 215. Europe.

1863.

75.—**Pterallastes** [*Pterelastes*] Loew, Centur., iv, 80. North America.

1864.

105.—*Lepidomyia* Loew (non Bigot, 1847), Centur., v, 38. North America.
16.—*Axona* Walker (non Stål, 1864), Proc. Linn. Ent. Soc., vii, 211. Mysol.
23.—*Planes* Rondani, Archiv. Zool. anat. e Fisiol., iii, 9. Europe.

1865.

84.—*Mesogramma* Loew, Centur., vi, 47. North America.
76.—**Pteroptila** [*Pterophila*] Loew, ibid., 59. North America.
19.—*Cnemodon* Egger, Verh. zool.-bot. Gesellsch., xv, 573. Europe.
77.—*Eriophora* Phillipi, Verh. zool.-bot. Gesellsch., xv, 735. South America.
78.—**Sterphus** Phillipi, ibid., 737. South America.
37.—**Stilbosoma** Phillipi, ibid , 736. Europe.
79.—**Macrometopia** Phillipi, ibid., 740. South America.
19.—*Penium* [*Pennium*] Phillipi, ibid., 741. South America.
Pia Phillipi, ibid., 742. South America.
80.—**Palumbia** Rondani, Atti Soc. Ital. sc. nat., viii, 129.
81.—**Aspeytia** [*Aspeitia*] Walker, Proc. Lin. Soc., viii.

1868.

82.—**Salpingogaster** Schiner, Novara Exped., 344. South America.
83.—**Exocheila** [*Exochila*] Rondani, Atti d. Soc. Ital. sc. nat., xi.
Glaurotricha (*Haurotricha*) Thomson, Eugen. Resa. South America.

1869.

12.—*Mesophila* Walker, List, etc., iv, 1157. North America.

1872.

84.—**Mesograpta** Loew, Centur., vol. ii, 210. North America.

1876.

85.—**Allograpta** Osten Sacken, Bull. Buff. Soc. Nat. Sc., iii, 49. North America.
86.—**Teuchocnemis** Osten Sacken, ibid., 58. North America.

1877.

87.—**Catabomba** Osten Sacken, West. Dipt., 325. North America.
88.—**Eupeodes** Osten Sacken, ibid., 328. North America.

1878.

89—**Crioprora** Osten Sacken, Cat. Dipt., 136. North America.
39.—*Acrochordonodes* Bigot, Bull. Soc. Ent. Fr., No. 13, 131. S. America.

1879.

90.—**Merapioidus** [*es*] Bigot, Bull. Soc. Ent. Fr., No. 6, 64. North America.

1881.

91.—**Solenaspis** Osten Sacken, Ann. d. Mus. civ. d. stor. nat. Genoa, 442. New Guinea.

1882.

37.—*Brachymyia* Williston, Canadian Entomologist, xiv, 77. North America.
31.—*Hadromyia* Williston, ibid., 78. North America.
98.—**Eugeniamyia** [*Eugeniomyia*] Williston, ibid., 80. North America.
3.—*Ancyclosyrphus* Bigot, Bull. Soc. Ent. Fr., No. 6,78. Europe.
37.—*Eurhinomallota* Bigot, ibid., 78. Mexico.
92.—**Simosyrphus** Bigot, ibid., 79.
3.—*Ischyrosyrphus* Bigot, ibid., 78. Europe.
93.—**Ptilostylomyia** Bigot, ibid., No. 12. Spain.
2.—*Atemnocera* Bigot, ibid. South America.
94.—**Doliosyrphus** [*Dolyosyrphus*] Bigot, ibid., No. 13. Central America.
95.—**Tigridemyia** [*Tigridimyia*, *Tigridiamyia*] Bigot. ibid. Java.
96.—**Prionotomyia** [*Prionotomys*] Bigot, ibid. Senegal.
97.—**Eumerosyrphus** Bigot, ibid., No. 14. India.
10.—*Asemosyrphus* Bigot, ibid. Mexico.
89.—*Romaleosyrphus* Bigot, ibid. Mexico.
99.—**Ortholophus** Bigot, ibid. Chili.
100.—**Kirimyia** Bigot, ibid., No. 15. Japan.
101.—**Endoiasimyia** Bigot, ibid. India.

1883—1886.

10.—*Eurhimyia* Bigot, Bull. Soc. Ent. Fr., No. 3. Europe.
26.—*Cartosyrphus* Bigot, Annales Soc. Ent. Fr., 230. Europe.
27.—*Euceratomyia* Williston, 1884, Wien. Ent., Zeit., iv. North America.
102.—**Nausigaster** Williston, 1885, Trans. Amer. Ent. Soc. North America.
103.—**Chalcomyia** Williston, Bull. Brookl. Ent. Soc., vii, 133. North America.
104.—**Triodonta** Williston, ibid., 1886, p. 136. North America.
105.—**Lepromyia** Williston, ante, p. 31. North America.
106.- **Cynorhina** Williston, ante, p. 209. North America, Europe.
107.—**Neoascia** Williston, ante, p. 111.

DEFINITION OF TERMS.

HEAD.

Holoptic.—Contiguity of the eyes in the male, between the vertex and the antennæ.

Dichoptic.—Separation of the eyes by the front in all females, and some males as in *Chalcomyia*, *Helophilus*, *Triodonta*, *Criorhina* sp., etc.

Vertex.—The uppermost border of the head between the eyes.

Ocelli.—Three small, simple eyes near the vertex on the upper part of the front.

Front.—The space included between the eyes, the vertex, and the antennæ.

Vertical triangle.—In the male the small triangle upon which the ocelli are situated, limited behind by the vertex, in front by the eyes.

Frontal triangle.—In the male the triangular space between the eyes below, limited by a line drawn through the base of the antennæ.

Frontal or *antennal process.*—The more or less pronounced projection upon which the antennæ are inserted.

Antennæ.—Inserted close together in the line between the front and face, composed of three joints, the third of which bears the:

Arista.—A slender bristle situated upon the upper border of the third joint, microscopically jointed near its base; or:

Style.—A thickened jointed arista (in *Ceria* and *Pelecocera*) situated at or near the tip of the third joint.

Face.—The space between the base of the antennæ and the oral margin, limited on the sides by the eyes and cheeks.

Facial tubercle.—A more or less pronounced median convexity below the middle of the face.

Cheeks.—The space between the lower borders of the eyes and the oral margin, merging into the face in front and limited by the occipital margin behind.

Occiput.—The whole posterior surface of the head.

Orbits.—A narrow indefinite space immediately bordering the eyes, and called vertical, or superior; frontal and facial, or anterior; the orbits of the cheek, or inferior; occipital, or posterior.

Epistoma.—The oral margin of the face, and the region immediately adjacent.

Oral or *buccal* cavity.—The mouth.

Proboscis.—Mouth organs, near the base of which are inserted the small, one-jointed *palpi*, and terminating in two fleshy lips, the *labellæ*.

Mentum.—The posterior oral margin.

THORAX.

Dorsum.—The whole upper surface, limited by the dorso-pleural sutures laterally, the scutellum posteriorly, and the neck anteriorly.

Pleuræ.—The lateral surfaces of the thorax.

Pectus.—The inferior surface of the thorax between the legs.

Scutellum.—A sub-hemispherical body behind, cut off by an impressed line from the dorsum of the thorax.

Metanotum.—The posterior surface of the thorax between the scutellum and the base of the abdomen.

Humeri or *shoulders.*—The anterior superior angles of the thorax.

Post-alar callosities.—Rounded processes on the posterior lateral margins of the dorsum.

Transverse suture.—A transverse groove in front of the root of the wings, obsolete in the middle of the dorsum.

Dorso-pleural suture.—The lateral suture, between the dorsum and the pleuræ, extending from the humeri through the base of the wings.

Tegulæ.—Two membranous scales situated behind the immediate base of the wing, the upper overlapping the under.

Halteres or *balancers.*—An organ with a slender stem terminating in a rounded knob, inserted in the metathorax just in front of the lateral base of the abdomen.

ABDOMEN.

Incisures.—The sutures separating the segments.

Venter.—The whole under surface of the abdomen.

Hypopygium.—The male sexual organs and terminal segments of abdomen.

Oviduct or *ovipositor.*—The terminal segments of the female abdomen.

LEGS.

Coxæ.—Basal segment attached to the thorax, terminating in a small ring-like segment, the *trochanter*. The next most elongate portion is the *femur;* then follows the *tibia;* the joint between them is called the *knee*, and expresses the immediate contiguous portions of the femur and tibia.

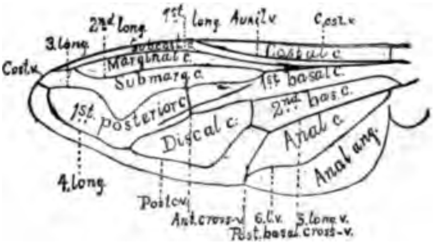
Feet.—Composed of the five joints of the *tarsi*, the basal one of which is called the *metatarsus*, the distal one terminating in two *claws* or *ungues*, on the under side of each of which is a small membranous appendage, the *pulvillus*.

WINGS.

Borders or *margins*, *anterior*, *exterior*, and *posterior* of the wing, directed transversely.

Alulet.—The lobe or flap of the wing, without veins, on the basal posterior part.

Venation.—*Costal vein*, the one bordering the anterior margin of the wing; *auxiliary*, nearly parallel with the costa from the base, and terminating in that vein near its middle; connected towards its base with the costa by a transverse cross-vein, the *humeral cross-vein;* the *first longitudinal* vein arises from the auxiliary-vein in the vicinity of the humeral cross-vein, follows the auxiliary subparallel, and is inserted in the costa; the *second longitudinal* vein arises from the first longitudinal a little beyond the humeral cross-vein, follows the former, and is inserted in the costa, or sometimes in the first vein before its tip; the *third longitudinal* arises by a fork from the second longitudinal, a little distance before the termination of the auxiliary, and is inserted in the costa at its tip; in its course it gives off a short branch, the *anterior* or *small cross-vein*, to connect with the fourth longitudinal vein; *fourth longitudinal* vein arises from the second main vein-stem opposite the humeral cross-vein and terminates in the third longitudinal a short distance before its tip; it gives off, first the *anterior basal cross-vein* behind, opposite the origin of the third vein, second the anterior cross-vein to connect with the third longitudinal, and, just before it bends forward to connect with the third vein, it receives the *posterior cross-vein;* the *fifth longitudinal* vein arises near the origin of the fourth and terminates a little before the posterior border of the wing; opposite the anterior basal cross-vein it gives off the *posterior basal cross-vein*, is then directed angularly forwards to join the anterior basal cross-vein, then follows parallel to its first section to connect with the posterior cross-vein where it terminates, or is sometimes extended a short distance as a stump; the *sixth longitudinal vein* arises near the origin of the fifth and terminates in or near the posterior border of the wing, a little before the middle; just before its end it receives the *posterior basal cross-vein*.



Wing of *Eristalis*.

The *costal* cell is included between the auxiliary vein and the costa. The *subcostal* cell is bounded in front by the auxiliary vein and the costa, behind by the first longitudinal. The *marginal* cell is inclosed by the first and second longitudinal veins, wholly when the cell is closed, in part in front by the costa when the cell is open. The *submarginal* cell lies between the second and third veins, touching the costa exteriorly for a short distance, and the tip of the first longitudinal vein when the marginal cell is closed. The *first basal* cell is bounded in front by the basal sections of the first, second, and third longitudinal veins, exteriorly by the anterior cross-vein, posteriorly by the fourth longitudinal vein. The *second basal* cell is bounded in front by the fourth longitudinal vein, exteriorly by the anterior basal cross-vein and the second section of the fifth longitudinal vein, posteriorly by the fifth longitudinal. The *third basal*, or *anal*, cell is bounded in front by the fifth longitudinal vein, exteriorly by the posterior basal cross-vein, posteriorly by the sixth longitudinal. The *first posterior* cell is bounded in front by the third longitudinal, behind and exteriorly by the ultimate and penultimate sections of the fourth vein, internally by the anterior cross-vein. The *discal* cell is inclosed in front by the fourth longitudinal, behind by the fifth longitudinal, exteriorly by the posterior cross-vein, internally by the anterior basal cross-vein. The *third posterior* cell lies between the fifth longitudinal and the posterior basal cross-vein.

Stigma.—A colored spot near the tip of auxiliary vein.

VESTITURE.

Pile.—This term properly should be restricted to thick, fine, short, and erect hair, as in the pile of velvet; in reality, however, the word is incapable of definite limitation, and is here generally employed, the word hair being only used to express very sparse or coarse pile, as in the hair of the face in *Chilosia*, or the sparse vestiture of the eyes in *Syrphus*.

Macrochætæ, or bristles, are only present in *Chilosia*, spp., *Brachyopa*, spp., *Eugeniomyia*, *Volucella*, spp., and *Chrysochlamys*, on the thorax, and in a few others on the legs; never on the head.

Pollen, or *dust*, is that which conceals or obscures the shining or opaque ground color to a greater or lesser degree, and is more or less easily removed by moisture or rubbing.

Tomentum primarily indicates short, flattened, appressed hairs, and is only found in *Lepromyia*, *Myiolepta*, *sp.*,though in some other cases the term is used to designate coarse pollen, as in *Temnostoma*.

Pubescence is here used only to indicate very short, nearly microscopical hairs, on the arista, wings, etc.

APPENDIX.

MIXOGASTER.

Mixogaster Macquart, Dipt. Exot., ii, 2, 14, 1842.

This genus will be recognized without difficulty from what has been given in the introduction. The known species resemble *Ceria* in shape, but with the head of *Microdon*. Type of genus, *M. conopsoides* Macquart, South America. Thomson has described a species from Australia.

Mixogaster mexicanus Macquart, Dipt. Exot., 1er Suppl., 123, pl. x, fig. 15.—Mexico.

PIPIZA.

Pipiza crassipes.

Pipiza crassipes Bigot, Ann. Soc. Ent. Fr., 1884, 557.

Habitat.—North America (Bigot).

♀. Length, 7^{mm}. *Nigra, vix nitida. Antennarum segmento tertio chetoque fulvis; facie cinereo parcè tomentosâ; calyptris albis, halteribus testaceis; alis pallidissimè fuscanis, basi hyalinis, maculâ stigmaticali testaceâ; pedibus posticis parum incrassatis.*

D'un noir peu luisant, presque glabre. Antennes 3e segment et chète fauves; face avec un fin duvet grisâtre, clair semé; un peu de duvet blanc sur les flancs ainsi que sur les cuisses; cuillerons blancs, balanciers testacés; ailes un peu roussâtres, hyalines à la base, macule stigmatique roussâtre; genoux fauves, pieds postérieurs légèrement épaissis, surtout le métatarse.—1 specim., —, Bigot, *l. c.*

Pipiza puelchella, ante, p. 27.

It is not improbable that *Chrysogaster Apisaon* Walker, List, etc., iii, 572 (New York), is the same as this. At least the hairy eyes and elongate antennæ indicate that it is a *Pipiza* (*Pipizella*) or *Psilota.*

PSILOTA.

Psilota buccata.

An examination of a number of specimens in the National Museum enables me to give a more complete description of this species.

♂. Length, 8^{mm}. Metallic black. Antennæ black; third joint elongate, about four times as long as wide, reaching nearly to the epistoma. Epistoma small, not much projecting. Face white pilose. Eyes long, luteous yellow pilose. Dorsum of thorax rather thickly reddish yellowish pilose. Abdomen elongate oval, shining black with a light brassy reflection; pile reddish yellowish, abundant, erect. Legs black. Base of tibiæ and tarsi luteous. Wings brownish on outer part; last two sections of fourth vein nearly equal, short appendiculate at the angle, first posterior cell short petiolate.

♀. Face nearly vertical and straight to just above the epistoma, which is moderately produced. Pile of front darker. Dorsum of thorax with rather thin lutescent pile. Abdomen broadly oval, the fourth segment long, the fifth nearly concealed; in color, shining black, with a bronze reflection; pile lutescent.

Six specimens, Texas. Two other specimens from Georgia are a little smaller, the third joint of the antennæ is a little shorter, and the abdomen is less metallic. The male has the face below the antennæ more concave, and the pile of the dorsum of the thorax more blackish across the middle. Very likely there are two species here.

CHILOSIA.

Chilosia hoodiensis.

Cartosyrphus hoodianus Bigot, Am. Soc. Ent. Fr., 1884, 552.

Habitat.—Oregon (Bigot).

♀. Length, 9$^{\mathrm{mm}}$. *Nigra, sparse fusco et cinereo tomentosâ. Antennis fulvis, cheto fusco, brevissimè tomentoso; facie nigro nitido, utrinque fusco tomentosa, fronte nigro villosa; oculis villosis; thorace scutelloque nitidis, fusco villosulis; calyptris ferè albidis, halteribus apice castaneis; abdomine nigro opaco, utrinque cinereo villosa, segmentis* 1, 4 *et* 5*is nitidis*, 2, *et* 3*is utrinque, basi, late nitidis; pedibus nigris, geniculis tibiarumque basi, fulvis; alis pallidè cinereis, basi maculâque stigmaticali infuscatis—G. Cheilosia*, propr. dict.

Antennes fauves, chète brun, très mèdiocrement tomenteux; face d'un noir luisant avec quelques poils bruns sur les côtés; front á poils noirs; yeux velus; thorax noir luisant, clairsemé de poils bruns; cuillerons blanchâtres, balanciers à massue brune; abdomen d'un noir mat, muni d'assez longs poils gris sur les côtés, 1er, 4e, et 5e segments luisants, 2e et 3e de chaque côté, une macule trigonale luisante; pieds nors, quelques poils clair semés gris, genoux, base des tibias étroitement fauves; ailes d'un gris très clair, plus foncées vers le bord externe, base, macule stigmatique, d'un roux pâle.—1 specim., Mount Hood. — Bigot, *l. c.*

I identify a male specimen from Mount Hood as this. The pile of the head and dorsum of the thorax is black. The fourth abdominal segment is shining metallic, like the anterior triangular spots on the second and third segments; the wings are very distinctly brownish in front; and I cannot distinguish any pubescence on the arista.

Chilosia lævis.

Cartosyrphus lœvis Bigot, Ann. Soc. Ent. Fr., 1884, 553.

Habitat.—Washington Territory (Bigot).

♀. Length, 7$^{\mathrm{mm}}$. *Tota nigra, nitida, nuda. Cheto, facie oculisque nudis; calyptris albis, halteribus testaceis; alis pallidè testaceis.*

Entièrement d'un noir luisant, brièvement clairsemé d'un duvet grisâtre; chète, face, yeux, nus; cuillerons blancs, balanciers testacées; ailes un peu jaunâtres; quelques macrochètes noirs au bord de l'écusson.—1 specim. — Bigot, *l. c.*

Chilosia tristis.

I am wrong in uniting the male and female specimens described under *C. pallipes.* Notwithstanding the fact that specimens were collected together, almost indeed at the same moment, they belong, I believe, to different species. My reasons I find in the shape of the first posterior cell. In *C. tristis* (the males) it is broader, and the last section of the fourth vein comparatively longer than in *C. pallipes* (the females). The female of *C. tristis*, according to Loew, differs also, apparently, in not having the light-colored humeri.

SYRPHUS.

Syrphus fumipennis.

Syrphus fumipennis Thomson, Eugenies resa, 499.

Habitat.—California (Thomson).

♂. Length, 10^{mm}. Eyes bare, frontal triangle fuscous pilose, yellowish; face slightly concave below the antennæ, yellowish-white; cheeks bronze fuscous, subopaque; the lateral and front oral margin blackish, shining. Antennæ yellow. Thorax bronze fuscous, the sides more yellowish; pile pallid; scutellum pallid testaceous, with fuscous and pallid pile intermixed. Wings somewhat smoky. Abdomen oval, subdepressed; short, pallid pubescent; second segment deep black, long yellow pilose on the sides, with a yellow, triangularly oval spot on each side, the sides anteriorly confluent with the margin; third and fourth segments deep black, with a broad yellow posteriorly sinuate fascia; hind margin of the fourth and fifth segments testaceous; hypopygium shining black. Legs yellow, base of the femora black fuscous.

The above is an abstract of Thomson's very long and redundant Latin description. He says of the species, that is is very similar to *S. corollæ*, but differs in the smoky wings and abdominal bands. I cannot apply the description to any species which I know, though I think it comes nearest to *Americanus.* The legs are said to be black only at the base of the femora, and the bands of the third and fourth abdominal segments are not stated to reach the margin.

Syrphus ochrostoma.

Syrphus ochrostoma Zetterstedt, Dipt. Scand., viii, 3133; Schiner, Fauna Austr., i, 310; v. d. Wulp, Tijdschr. v. Ent., xxv, 134.

Habitat.—Europe, Canada (v. d. Wulp).

♂, ♀. Length, 12^{mm}. Is like *S. ribesii*, but the scutellum is yellow pilose, and the femora are wholly yellow.

Syrphus tarsatus.

Syrphus tarsatus Zetterstedt, Ins. Lapp., 601, 2; Dipt. Scand., 730, 33; Staeger, Groenl. Antl., 360, 27.

Habitat.—Europe, Greenland.

Length, 8^{mm} to 9^{mm}. Shining metallic, blackish-green. Eyes pilose. Face yellow, oral margin black. Antennæ blackish. Abdomen with three straight, interrupted bands. Legs reddish-yellow; base of femora and tarsi black; hind tibiæ with a brown or blackish ring. Scutellum yellow.

Syrphus dimidiatus.

Syrphus dimidiatus Macquart, Hist. Nat. Dipt., i, 537.

Habitat.—Georgia (Macq.).

Length, 10.5^{mm}. Black, sides of the face whitish. Third joint of antennæ reddish below. First band of abdomen interrupted, the others broad, entire. Legs yellow; hind pair and base of front femora black. Wings brown on the anterior part.—Macquart.

This description is not sufficient to admit of identification.

MESOGRAPTA.

Mesograpta marginata.

The following synonym was omitted under this species:

Syrphus limbiventris Thomson, Eugenies resa, 485, 83.—California.

Mesograpta coalescens.

Syrphus coalescens Walker, Dipt. Saunders, 237.—North America.

Mesograpta corbis.

Syrphus corbis Walker, Dipt. Saunders, 237.—North America.

"Both are *Mesograptæ*, each represented by a single specimen in the British Museum. I find in my notes that both produced on me the impression of *M. Boscii*, although the description of *S. coalescens* reads more like that of *M. planiventris* Loew; the female described by Walker is probably a different species."—Osten Sacken, Cat. Dipt., 125, note.

COPESTYLUM.

Macquart's figure of *C. flaviventris* shows as much resemblance to *C. limbipennis* as it does to *C. marginatum*, but the descriptions will not apply to the former at all, especially as regards the structure of the antennæ.

HELOPHILUS.

TABLE OF SPECIES.

1.—Face jutting forward into a cone 2
  Face not conically produced forwards 3
2.—Face obtusely conic . . . . hamatus
  Face sharply conical . . . . conostomus
3.—Sixth longitudinal vein distinctly sinuous 4
  Sixth vein nearly straight or only gently curved 7
4.—Dark colored species 5
  Light colored species; stripes of thorax distinct 6
5.—Southwestern species . . . . mexicanus
  Northern species . . . . { glacialis, grœnlandicus, borealis
6.—Front of female black pilose; front of male narrow above . . . . . similis
  Front of female black pilose only near the ocelli; front of male broad . latifrons
7.—Antennæ reddish yellow 11
  Antennæ dark 8
8.—Third joint of antennæ pitchy or more or less reddish 9
  Antennæ wholly black 10
9.—Abdomen with yellow bands . . . . obscurus
  Abdomen velvet-like black, each segment with a tringular black shining spot in the middle, and a hoary spot on each side . . . . porcus
10.—Abdomen with light colored bands . . . . Novæ Scotiæ
  Abdomen wholly black . . . . modestus
11.—Abdomen elongate, cylindrical in the male 12
  Abdomen oval; face yellow 13
12.—Hind coxæ of the male with a stout process below . . . . . chrysostomus
  Hind coxæ of the male not with a stout process . . . . distinctus
13.—Dorsum of thorax with two slender obsolete luteous pollinose stripes . obsoletus
  Dorsum with distinct light colored stripes 14
14.—Abdomen distinctly banded . . . . { integer, lætus, divisus, ? flavifacies
  Third segment, except a small opaque spot in front, and the fourth, shining submetallic black . . . . bilinearis

Helophilus bilinearis, n. sp.

Habitat.—Colorado!

♂. Length, 9mm. Head in profile similar to that of *H. lætus*, the angle of the cheeks with the occiput a little more obtuse. Face yellowish white, clothed with white pollen and pile; cheeks shining black. Antennæ reddish yellow; arista luteous. Lower part of the front like the face, on the upper part brownish black with black pile; the pile of the vertex light colored. Thorax opaque black; two median, remote, linear stripes, cinereous, the lateral margins ochraceous cinereous; pile yellowish white. Scutellum obscurely yellow, the narrow base and outer angles black; pile wholly light colored. Abdomen elongate oval, broadest on the second segment; first segment shining, dusted on the sides; second segment opaque black, on the lateral margins an elongate yellow spot, its inner margin shining beneath cinereous pollen which extends acutely inward near the middle; third segment with a small hourglass-shaped opaque spot, on each side of which faintly whitish dusted, the extreme anterior angles luteous; fourth segment luteous on the hind border; the rather broad posterior part of the second, and the third and fourth, shining, somewhat metallic, black; pile on the sides in front long, nearly white, elsewhere shorter, but of nearly the same color. Legs black, hind femora on outer half and the hind tibiæ, except two indefinite darker rings, red; tip of four anterior femora, their tibiæ and middle tarsi, luteous yellow; tip of front tibiæ and the front tarsi, brown. Wings cinereous hyaline; stigma minutely brown.

One specimen, Colorado.

CRIORHINA.

Criorhina pictipes.

Calliprobola pictipes Bigot, Ann. Soc. Ent. Fr., 1883, 354.
? *Criorhina notata* (Wiedemann), ante. p. 215.

Habitat—Carolina (Bigot).

♂. Long. 8 et 10^{mm}. *Antennis testaceis, supernè et apice fusco tinctis; palpis fuscis; facie, fronte conice elongatâ, flavo pallido; thorace, scutello et abdomine nigro œnescente, fulvo tomentosis, scapulis, vitta thoracica laterali marginibusque scutelli fulvis, incisuris abdominis, angustissime, maculisque duobus, basi, subtrigonis, fulvis; calyptris et halteribus pallide flavis; femoribus flavidis, nigro annulatis, tibiis anticis fuscis, basi flavidis tarsis anticis infuscatis, tibiis intermediis flavis tarsis apice fuscis, tibiis posticis flavidis, apice latè fusco annulatis tarsis flavidis;* [*alis hyalinis*] *basi et extrinsecus flavidioribus, venis transversis parum infuscatis.* ♀. *Simillima; fronte, supernè, late nigra.*

♂. Antennes testacées, brunes en dessus et à l'extrémité du 3^{e} segment, chète testacé, nu, à pointe brunâtre; palpes brunes; face, front, conique et notablement saillant, d'un blanc jaunâtre. Entièrement d'un noir bronzé à légers reflets cuivreux et duvet fauve, flancs, sous les ailes, avec une forte touffe de poils jaunâtres; thorax à partir de la suture, écusson, bordés de fauve, épaules fauves, métathorax, sous l'écusson d'un noir luisant, 2^{e} segment abdominal orné en dessus, à sa base, de deux macules presque trigonales, alongées, fauves, segments très finement bordés de fauve, l'abdomen moins tomenteux que le thorax; cuillerons et balanciers d'un jaunâtre pâle; hanches noirâtres, pieds d'un jaunâtre pâle, cuisses avec un anneau noir vers leur extrémité, tibias antérieurs à l'extrémité et tarses entièrement bruns, de même que les tarses postérieurs, tibias postérieurs largement brunâtres à leur extrémité, tibias et tarses intermédiaires d'un jaunâtre pâle, ces derniers noirâtres à l'extrémité; ailes d'un jaunâtre fort pâle, un peu plus foncé à la base et le long du bord externe, nervures transversales légèrement bordées de noirâtre. ♀. Semblable au mâle, front large et d'un noir assez luisant à sa partie supérieure; cuisses postérieures simplement garnies en dessous de poils fins, peu rigides; 2^e^ nervure transversale de l'aile très légèrement oblique et sise au milieu de cellule discoïdale.—2 spécim.—Bigot, *l. c.*

BRACHYPALPUS.

Brachypalpus Amithaon.

Milesia Amithaon Walker, List, etc., iii, 567.

Habitat.—North Carolina (Walker).

"♂. Body black, shining; head as broad as the chest, clothed with dark tawny hairs; mouth and feelers black; eyes brassy black; facets on the fore part of the crown rather larger than those elsewhere; chest clothed with dark tawny hairs; abdomen nearly linear, as broad as the chest and much longer; sides clothed alternately with black and dark tawny hairs; legs black, clothed with black hairs; foot-cushions and claws dark tawny; tips of claws black; hind thighs very thick, toothed beneath; hind shanks curved, with a knob on the inner side; wings dark gray, brown along the fore borders and on the sides of the veins of the disk; wing-ribs and veins black, some of the latter ferruginous toward the base; poisers ferruginous. Length of the body 7 lines; of the wings 15 lines."—Walker, l. c.

"*M. Amithaon*, which I saw in the British museum, looks very much like a *Brachypalpus*."—Osten Sacken, Cat. Dipt., 251. The description reads much like *B. frontosus*, except the "black and dark tawny hairs" of the abdomen. Is it a *Criorrhina?*

Brachypalpus Aepalius.

Xylota Aepalius Walker, List, etc., iii, 557.

? *Brachypalpus sorosis* Williston, ante, p. 223.

I neglected to compare Walker's description in describing my species, and only became aware of the apparent identity of his *Aepalius* in revising the description for insertion here. I believe they are the same, though the description is not very definite of the abdomen and pile of the thorax, and will apply equally well to *B. pulcher*.

OBSERVATIONS ON THE GENERA AND SPECIES DESCRIBED BY MR. BIGOT.

(Annales et Bulletin Soc. Ent. de France, 1883, 84, 85).

Phalacromyia vicina, Annales, 1883, 86.—Mexico.

Phalacromyia melanorhina, Annales, 1883, 86.—Mexico.

This genus differs from *Volucella* only in the marginal cell of the wings being open. Mr. Bigot gives a useful table of the known species of this genus and of *Volucella*.

Microdon gracile, Annales, 1883, 320.—Mexico.

Is not this the same as *M. baliopterus?* The descriptions read very much alike.

Microdon cothurnatum, Annales, 1883, 320.—Oregon.

Is *M. tristis*, var.

Chrysotoxum villosulum, Annales, 1883, 320.—Oregon.

I make this a synonym of what I call *C. derivatum* Walker, but it is possible that I have included more than one species under that name.

Ocyptamus fraternus, Annales, 1883, 324.—Mexico.

This is, according to the author, allied to *O. funebris* Macq. Schiner (Nov. Exped., 346), was not able to decide whether this species differed from *O. fascipennis* or not. Bigot's description of the wings has hardly anything in common with the latter.

Ocyptamus infuscatus, Annales, 1883, 324.—Mexico.

Is apparently allied to *O. latiusculus* Loew.

Ocyptamus rubriventris, Annales, 325.—Mexico.

Appears to be similar to *O. dimidiatus* Fabr.

Spazigaster bacchoides, Annales, 1883, 326.—California.

This is the same as *Baccha babista* Walker, which is widely distributed over the whole United States. The author places it in this genus on account of the oval third antennal joint. The arista is not plumose, and the hind tibiæ of the male are not bent, characters that are given for *Spatigaster*. However, I have never seen a specimen of this European genus, and cannot give any opinion as to the justness of Mr. Bigot's determination.

Ascia nasuta, Annales, 1883, 327.—Mount Hood.

Ascia quadrinotata, Annales, 1883, 327.—Mount Hood.

Ascia albipes, Annales, 1883, 328.—North America.

All of these, I believe, are only varieties of the common, widespread *Neoascia globosa* Walker.

Salpingogaster anchorata, Annales, 1883, 328.—Mexico.

Salpingogaster cothurnata, Annales, 1883, 329.—Mexico.

The genus *Salpingogaster* Schiner was described by the author as follows (Nov. Exped., 344):

"Auss der Gruppe der Syrphinen.—Kopf, Rückenschild und Hinterleib wie bei der Gattung *Bacha*, nur ist der letztere immer und in beiden Geschlechtern an der Basis sehr dünn, fast drehrund, vom zweiten Ringe an aber ungewöhnlich stark verbreitet und flachgedrückt, so dass er im Umrisse stark keulenförmig erscheint; gegen das Ende zu ist er sanft zugespitzt; die Genitalien des Männchens ragen vor und zeigen bei einer Art am Ende einen aufgebogenen Dorn. An den ziemlich langen Beinen sind die Hinterschenkel in der Regel gedornt, die Dornen aber klein; Vordertarsen des Weibchens breitgedrückt. Flügel gross; die Cubitalader [third longitudinal vein] ober der ersten Hinterrandzelle tief buchtig eingebogen (eben so stark wie bei *Eristalis*), der letzte Abschnitt der Discoidalader (die sogenannte Spitzenquerader [last section of the fourth vein] sehr stark S-förmig gebogen; die kleine Querader nahe vor der Mitte oder auf der Mitte der Discoidalzelle ziemlich lang; die Radialzelle [marginal cell] offen. Typische Art: *Salpingogaster pygophora* Schiner."—South America (14 to 15^{mm} in length).

Doros insularis, Annales, 1883, 330.—Cuba.

Whether this is a true *Doros* (*i. e.*, differing from *Xanthogramma* in the abdomen being clubbed, or the basal segments narrow) or not, cannot be made out from the description.

Eristalis opulentus, Annales, 1883, 336.—Cuba.

The species here described appears to be closely allied to those placed under *Pteroptila* (*Plagiocera*).

Sphixea fulvifrons, Annales, 1883, 341.—Georgia.

Notwithstanding the discrepancies in the description, there can be little or no doubt but that this is the widespread, common, and easily recognized *Milesia ornata*.

Lepidomyia cincta, Annales, 1883, 345.—Mexico.

To what genus this belongs I cannot say. The author was in uncertainty about *Lepidomyia*, for which he had grounds, as Loew's very brief diagnosis does not convey a very good idea of the genus. Bigot's species is, however, evidently no *Lepromyia*. The pilosity of the eyes and the light color of the scutellum indicate that it belongs somewhere in the vicinity of *Chilosia*.

Asemosyrphus oculiferus, Annales, 1883, 350.—Mexico, California.

Asemosyrphus nigroscutatus, Annales, 1883, 351.—Mexico.

The latter species the author separated on unimportant differences, and thought might be only a variety of *A. oculiferus*, a view in which I concur. They are both synonyms of *Helophilus Mexicanus*, which will be readily enough seen by comparing the description with male, not female, specimens.

Asemosyrphus flavicaudatus, Annales, 1883, 351.—Mexico.

Asemosyrphus bicolor, Annales, 1883, 350.—Mexico.

Whether these species belong to a genus distinct from *Helophilus* or not I cannot say.

Calliprobola ærea, Annales, 1883, 352.—Washington Territory.

Is a synonym of *Brachypalpus* (*Calliprobola*) *pulcher*.

Calliprobola calorhina, Annales, 1883, 353.—Washington Territory.

There is scarcely any doubt but that this is the same as *Sphecomyia Pattoni*. It has scarcely anything in common with the preceding species.

Calliprobola pictipes, Annales, 1883, 354.—Carolina.

See *Criorhina pictipes* above.

Brachypalpus Morrisoni, Annales, 1883, 355.—Washington Territory.

This is my *Pocota grandis*, described first as *Hadromyia grandis*. The author may be right in locating it under *Brachypalpus*, but the very broad abdomen differs much from that of the type of that genus. The palpi, moreover, are elongate.

Romaleosyrphus villosus, Annales, 1883, 356.—Mexico.

This genus, of which this is the type species, is evidently very closely allied to *Crioprora*, and probably identical. The only part of the generic diagnosis which I do not understand is, "*facie* * * *superne valde* * * *callosa*." The face in none of the species known to me has a callosity above, without the slight convexity below the antennæ is meant. The elongate palpi, the conically produced, concave in profile, face, the antennæ, the villosity, and the structure of the hind legs throughout, are characteristic of *Crioprora.* The species seems to be different from any previously described, especially distinctive in its large size (22^{mm}).

Ischyrosyrphus tricolor, Annales, 1884, 73.—California.

I identify this as *Syrphus velutinus.* The genus *Ischyrosyrphus* is separated from *Syrphus* solely by the pilosity of the eyes and is wholly untenable. See remarks under *Catabomba.*

Syrphus perpallidus, Annales, 1884, 90.—North America.

This is the very common Western *Eupeodes volucris* O. S.

Mesograpta ? bicincta, Annales, 1884, 112.—Mexico.
Mesograpta ? bistriga, Annales, 1884, 110.—Mexico.
Mesograpta ? circumdata, Annales, 1884, 107.—Mexico.
Mesograpta ? cuprina, Annales, 1884, 114.—Cuba.
Mesograpta ? heraldica, Annales, 1884, 109.—Mexico.
Mesograpta ? lacrymosa, Annales, 1884, 108.—Mexico, Brazil.
Mesograpta ? maculata, Annales, 1884, 111.—Mexico, Cuba, Brazil.
Mesograpta ? mu, Annales, 1884, 105.—Mexico.
Mesograpta ? pallipes, Annales, 1884, 106.—Mexico.
Mesograpta ? saphiridiceps, 1884, 105.—Mexico.
Mesograpta ? trilobata, Annales, 1884, 109.—Mexico.

It is to be regretted that Mr. Bigot should have thought fit to describe all these new species, while not sure of their generic location. He must certainly have misunderstood the genus, as its distinctive character, a median dorsal cinereous line, is usually easily apparent, and dissipates all doubt as to the affinities of the insects. That he has not rightly conceived the limits of the genus seems also certain from the fact that he has described species from New Caledonia, and it may safely be asserted that the genus is distinctively an American one. Other reasons make this addition of numerous new and imperfectly described or doubtful species unfortunate. Not a few *Syrphi* of the older authors are probably *Mesograptæ*, but whose distinctive characters cannot be made out till the widely distributed species are recognized from South America. Again there is a great variation among individuals, and single or even a few specimens are often insufficient to decide the variational limits. Furthermore, differences, or at least a tabular synopsis, should have been given. It is very much to be feared that Mr. Bigot's long interrogational list will remain an incumbrance to Mexican dipterology.

Myiolepta lunulata, Annales, 1884, 537.—Oregon.

Is the same as *M. varipes* Loew.

Brachyopa cinereovittata, Annales, 1884, 537.

This seems to be *B. vacua*, but the description of the thorax does not agree well.

Paragus auricaudatus, Annales, 1884, 540.—California.

This I identify with the common European *P. tibialis*.

Xylota rubiginigaster, Annales, 1884, 543.—Colorado.

I have immature specimens of *X. pigra* to which this description will apply fairly well.

Xylota annulifera, Annales, 1884, 545.—North America.

I do not see wherein this species differs from the common *X. ejuncida* Say.

Xylota satanica, Annales, 1884, 546.—California.

This description applies to *X. curvipes* except that the black of the tip of the hind femora is not mentioned. Possibly it is distinct.

Glaurotricha (Haurotricha) volucelloides, Annales, 1884, 548.—Mexico.

The author is in doubt whether to call this a *Glaurotricha* or a *Phalacromyia*. The genus corresponds to *Temnocera*, but with the marginal cell open as in *Phalacromyia*.

Cartosyrphus lamprurus, Annales, 1884, 552.—North America.

This is evidently *Chilosia capillata* Loew.

Cartosyrphus hoodianus, Annales, 1884, 552.—Mount Hood.

See *Chilosia hoodiensis* above.

Cartosyrphus infumatus, Annales, 1884, 553.—Mount Hood.

Is the same as *Chilosia nigripennis*.

Cartosyrphus lævis, Annales, 1884, 553.—Washington Territory.

See *Chilosia lævis* above.

The genus *Cartosyrphus* was characterized by the author as follows: "*Generis Chilosiæ veteris simillimum; differt, cheto et oculis glabris.*"

Melanogaster rufipes, Annales, 1884, 555.—North America.

I am unable to locate this species any more definitely than the author has done. The author's conception of the genus will be ascertained from the following, from his tabular synopsis of the genera of Syrphidæ (Ann. Soc. Ent. Fr., 1883, 258):

"Face dépourvue de sillons lateraux; antennes, 3e segment de grande dimension, orbiculaire: ♂, yeux contigus. *Cartosyrphus*. Id., ♀, pourvue de sillons lateraux; antennes, 3e segment de mediocre dimension. *Melanogaster*."

It will thus be seen that, in the acceptation of the present work, this species is a *Chilosia*. His description is as follows:

♂, ♀. Long. 8^{mm}. *Nigra, ferè nuda. Facie, thorace, scutelloque obscurè œnescentibus, parcè cinereo villosulis. Antennarum segmentis* [*secundis*] *et* [*tertiis*], *basi, fulvo obscuro tinctis; pedibus anticis fulvis, femoribus basi, tarsis apice, nigris, posticis, femoribus ferè totis, annulo tibiarum, tarsis totis, ejusdem coloris; alis hyalinis.*

Noire, clairsemé de poils grisâtres. Face, thorax, écusson, 1er segment de l'abdomen, luisants avec reflets bronzés; antennes fauves, noirâtres à la base ainsi qu'au-dessus du 3^{e} segment; face, avec des stries obliques très peu visibles de chaque côte, légèrement carénée et tuberculée, non concave; flancs avec un peu de duvet blanc; cuillerons et balanciers blancs, massue brune; abdomen d'un noir opaque avec deux larges macules latérales et basilaires d'un fauve obscur sur les 3^{e} et 4^{e} segments; pieds fauves, intermédiaires et antérieurs avec la base des cuisses et l'extrémité des tarses noirâtres, postérieurs avec les cuisses presque entièrement noirâtres, un large anneau sur les tibias, les tarses entièrement noirâtres; ailes hyalines, la macule stigmatique étroite, d'un jaunâtre pâle. Antennes, 3^{e} segment ovaloïde allongé; ailes, 5^{e} nervure longitudinale (Rondani) conformé comme chez la précédente espèce.—2 specim.

The "preceding species" (*Chrysogaster ? notata* from New Zealand) has the distal section of the fourth vein "oblique après le coude, mais courbé de manière à former un angle presque droit, brièvement appendiculée après le coude." Is it a *Melanostoma ?*

Melanogaster ochripes, Annales, 1884, 555.—Mount Hood.

Is a synonym of *Chilosia parva.*

Orthoneura sinuosa, Annales, 1884, 556.—Washington Territory.

Is *Chrysogaster stigmata ?*

Melanostoma cyaneocincta, Annales, 1885, 251.—Mexico.
Ocyptamus fenestratus, Annales, 1885, 251.—Mexico.
Eristalis rufoscutatus, Annales, 1880, 221.—Mexico.

EXPLANATION OF PLATES.

[All the figures are from nature, by the author.]

PLATE I.

1. MICRODON FUSCIPENNIS Macq., 1*a*, hind leg of male.
2. MICRODON BALIOPTERUS Loew?, head of male.
3. MICRODON TRISTIS Loew, wing; 3*a*, hind leg.
4. MICRODON GLOBOSUS Fabr., head of male.
5. CHRYSOTOXUM DERIVATUM Walker, wing; 5*a*, head of male; 5*b*, hind leg; 5*c*, antennæ of four different individuals.
6. CHRYSOTOXUM, sp. (PUBESCENS?).
7. PARAGUS BICOLOR Fabr., head of female.
8. PARAGUS TIBIALIS Fallen, head of female.
9. PARAGUS BICOLOR Fabr., wing.
10. NAUSIGASTER PUNCTULATA Will., male; 10*a*, wing, var.

PLATE I.

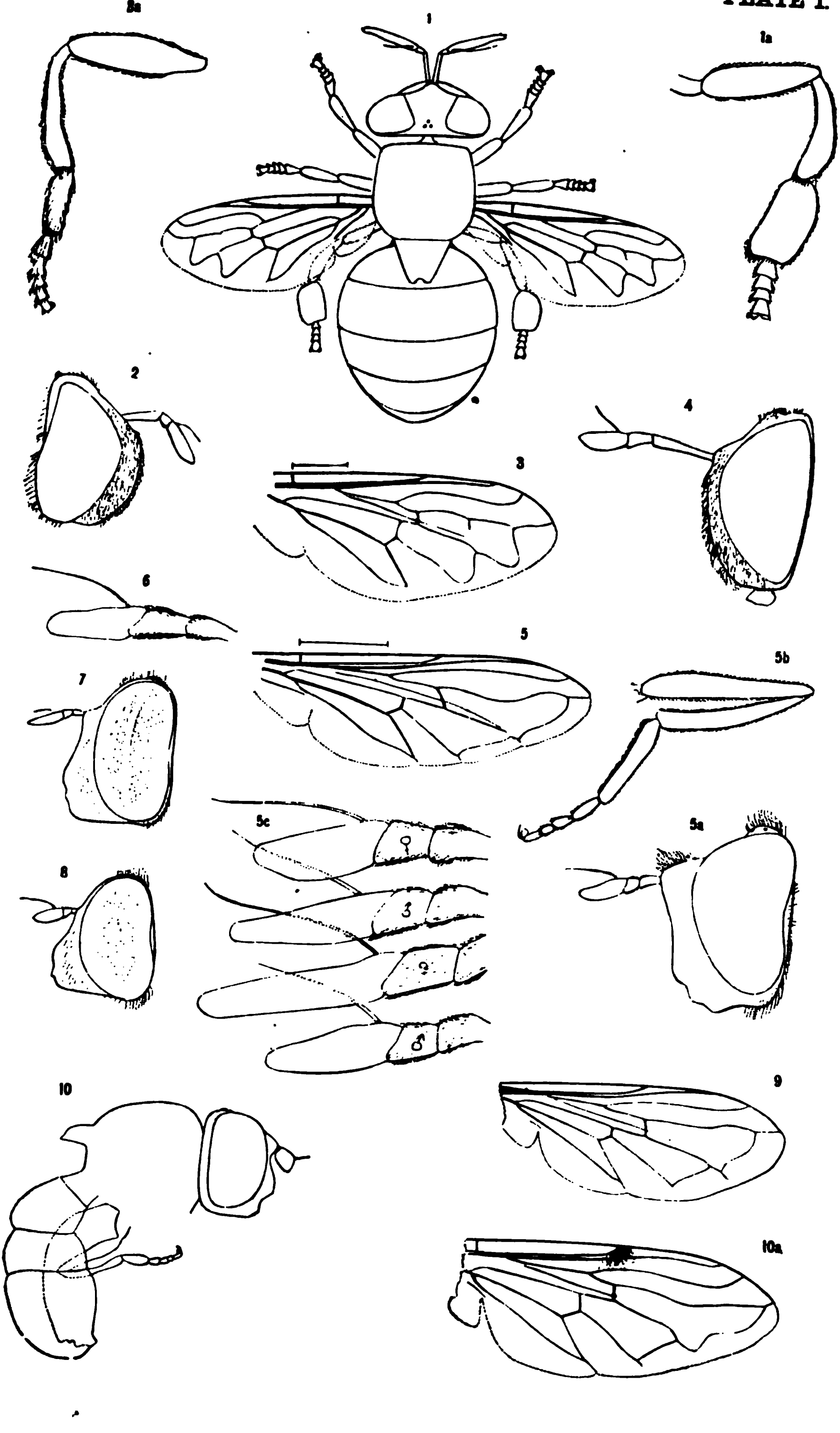


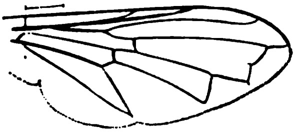
PLATE II.

1. PIPIZA PULCHELLA Will., wing; 1*a*, head of female; 1*b*, hind leg.
2. PIPIZA PISTICA Will., wing.
3. PIPIZA PUELLA Will., wing.
4. PIPIZA FESTIVA Meigen, head of female.
5. PIPIZA PISTICOIDES Will., antenna.
6. CHRYSOGASTER BELLULA Will., wing; 6*a*, head of male (the convexit is a little too great).
7. CHRYSOGASTER NITIDA Wied., wing; 7*a*, head of male.
8. CHRYSOGASTER NIGROVITTATA Loew, wing.

8*a*. CHRYSOGASTER STIGMATA Will., head of male.

9. CHRYSOGASTER PULCHELLA, Will., head of male.
10. CHRYSOGASTER NIGRIPES Loew, head of male; 10*a*, head of female;
11. CHRYSOGASTER NIGROVITTATA Loew, head of female.
12. CHRYSOGASTER STIGMATA Will., wing.
13. CHILOSIA PARVA Will., head of female.
14. CHILOSIA NIGRIPENNIS Will., head of male.
15. CHILOSIA PETULCA Will., head of female (the lower border of th scends too much in front).

PLATE II.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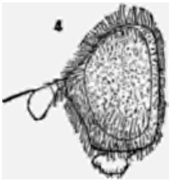
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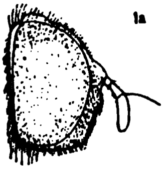
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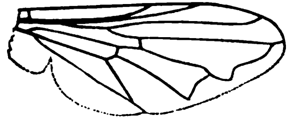
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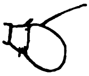
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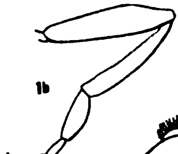
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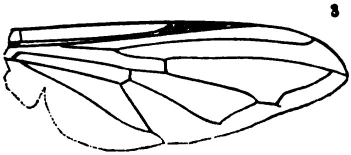
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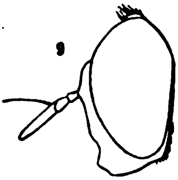
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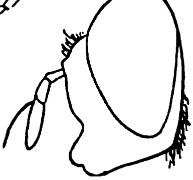
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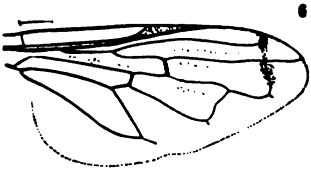
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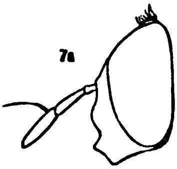
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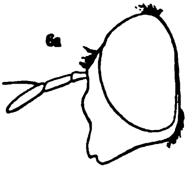
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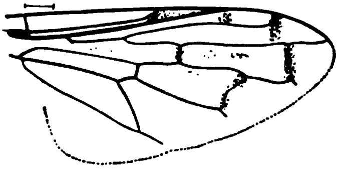
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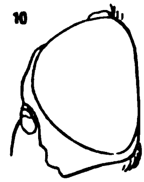
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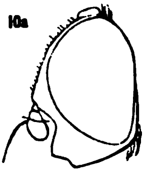
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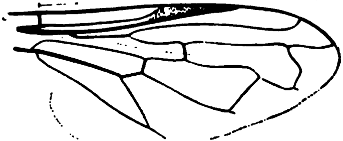
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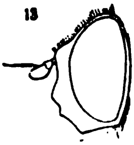
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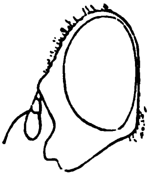
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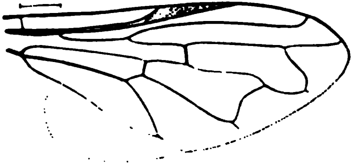
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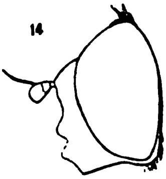
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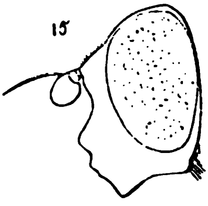
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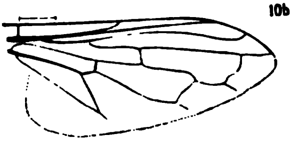
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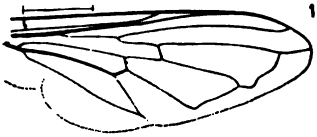
PLATE III.

1. CHILOSIA OCCIDENTALIS Will., wing; 1*a*, head of male.
2. CHILOSIA LASIOPHTHALMA Will., head of male.
3. CHILOSIA CYANESCENS Loew, wing.
4. CHILOSIA PLUMATA (CYANESCENS) Loew, head of female.
5. CHILOSIA TRISTIS Loew, head of male (Washington specimen).
6. LEUCOZONA LUCORUM Linné, wing; 6*a*, head of male.
7. MELANOSTOMA ANGUSTATUM Will., head of male.
8. MELANOSTOMA TIGRINUM O. S., head of male.
9. MELANOSTOMA MELLINUM Linné, head of male.
10. PLATYCHIRUS QUADRATUS Say, head of male; 10*a*, right front tibi
male.
11. PLATYCHIRUS PELTATUS Meig., head of male; 11*a*, left front tibi
male.
12. PLATYCHIRUS HYPERBOREUS Staeger, right front tibia and tarsus
13. PYROPHÆNA OCYMI Fabr., abdomen of female; 13*a*, right front ti
of male; 13*b*, left middle tibia and tarsus of male; 13*c*, wing.
14. EUPEODES VOLUCRIS O. S., abdomen of male; 14*a*, hypopygium.

PLATE III.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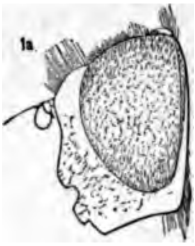
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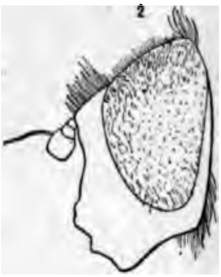
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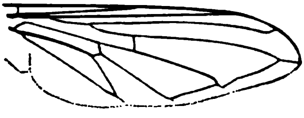
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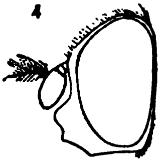
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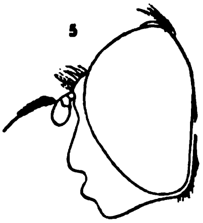
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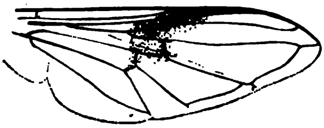
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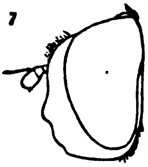
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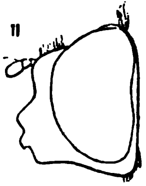
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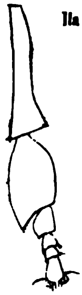
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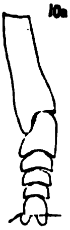
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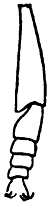
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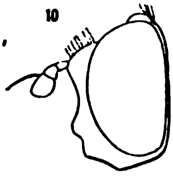
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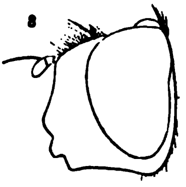
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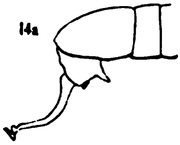
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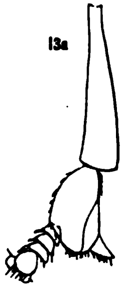
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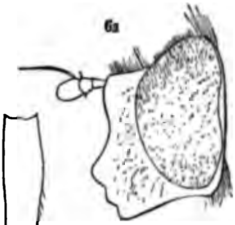
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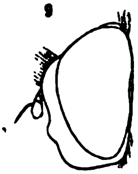
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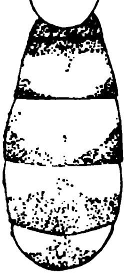
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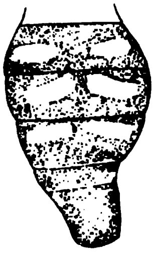
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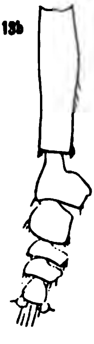
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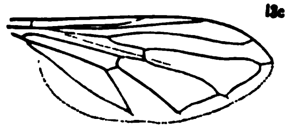
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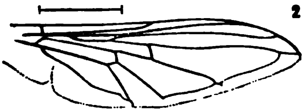
PLATE IV.

1. CATABOMBA PYRASTRI Linné, head of male, from in front; 1*a*, hea
2. SYRPHUS LESUEURII Macq., wing.
3. SYRPHUS GENICULATUS Macq., head of male.
4. DIDEA LAXA O. S., wing; 4*a*, head of male.
5. MESOGRAPTA GEMINATA Say, head of male; 5*a*, hind leg of male.
6. XANTHOGRAMMA ÆQUALE Loew, head of female.
7. BACCHA AURINOTA Walker, wing.
8. BACCHA FUSCIPENNIS Say, head of male; 8*a*, the same, front view
9. BACCHA BABISTA Walk., head of female.
10. NEOASCIA GLOBOSA Walk., wing; 10*a*, head of male.
11. SPHEGINA KEENIANA Will., wing.
12. SPHEGINA INFUSCATA Loew, wing; 12*a*, head of male.
13. PELECOCERA PERGRANDEI Will., male.
14. CHALCOMYIA ÆREA Loew, head of male; 14*a*, head of female.
15. MYIOLEPTA NIGRA Loew, head of female.
16. SPHÆROPHORIA CYLINDRICA Say, head of male; 16*a*, abdomen of

PLATE IV.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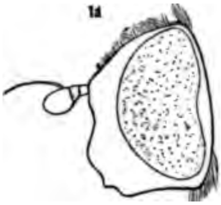
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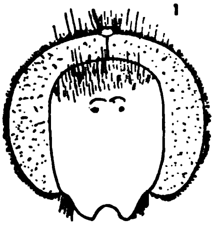
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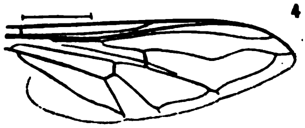
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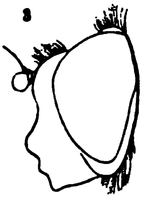
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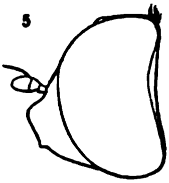
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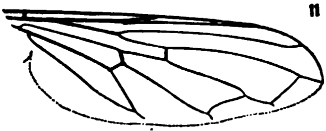
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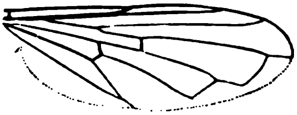
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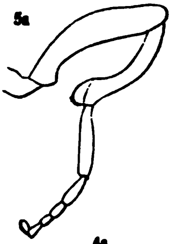
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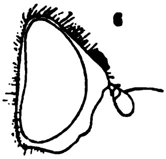
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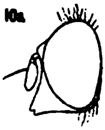
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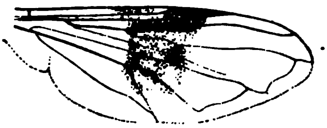
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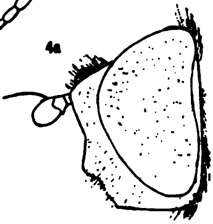
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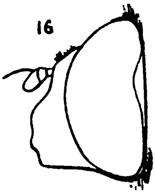
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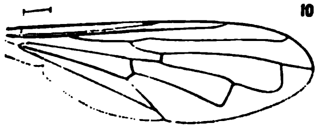
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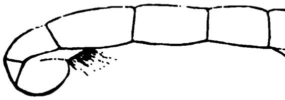
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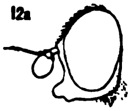
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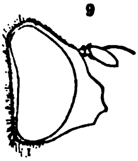
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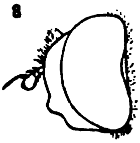
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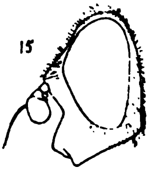
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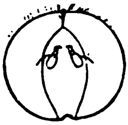
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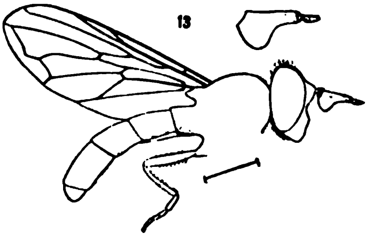
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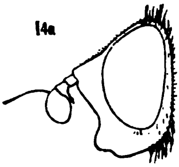
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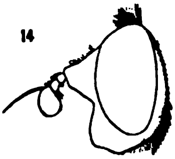
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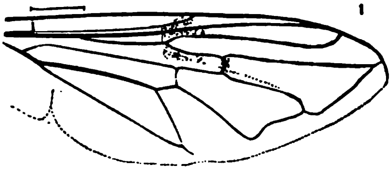
1

PLATE V.

1. Myiolepta varipes Loew, wing; 1*a*, head of male; **1*b*, head of fem**
2. Myiolepta bella Will., head of female; **2*a*, wing.**
3. Rhingia nasica Say, head of male; 3*a*, wing.
4. Eugeniamyia ferruginea Fallen, wing; **4*a*, head of male; 4*b*, th**
   view.
5. Brachyopa notata O. S., wing; 5*a*, head of female.
6. Brachyopa notata O. S., head of male.
7. Brachyopa media Will., head of female.
8. Volucella Hagii Jænn., head of male.
9. Volucella obesa Fabr., head of male.
10. Baccha dimidiata Fabr., wing, female.

PLATE V.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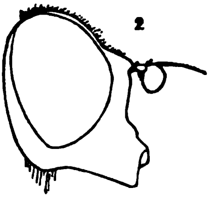
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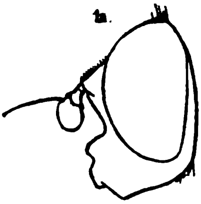
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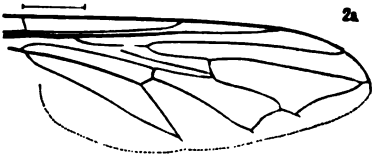
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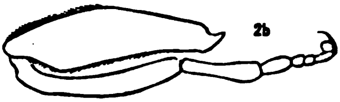
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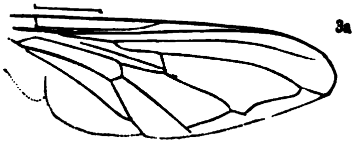
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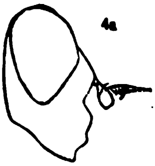
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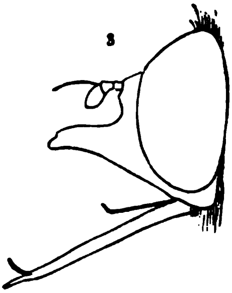
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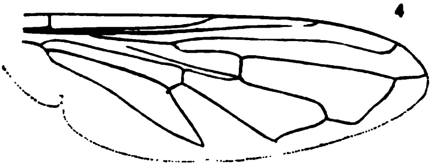
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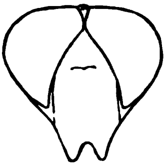
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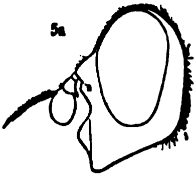
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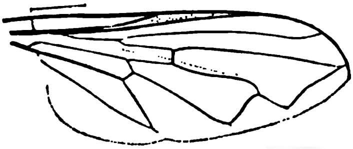
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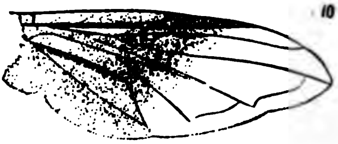
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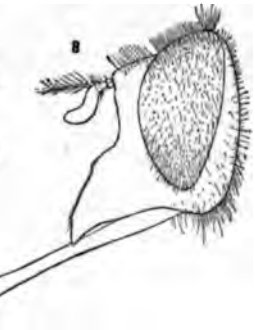
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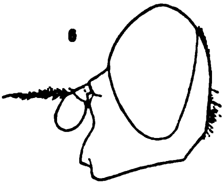
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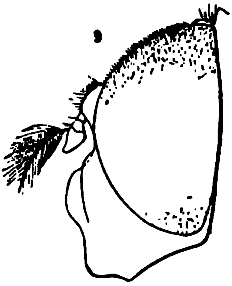
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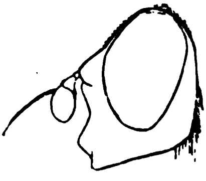
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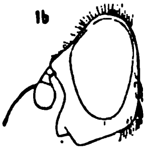
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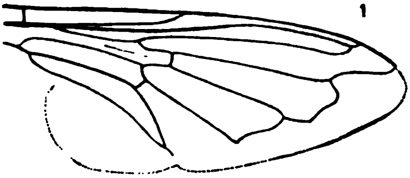
PLATE VI.

1. **VOLUCELLA VESICULOSA** Fabr., wing; 1*a*, head of male.
2. **VOLUCELLA SEXPUNCTATA** Loew, wing.
3. **VOLUCELLA PUSILLA** Macq., wing; 3*a*, head.
4. **VOLUCELLA FASCIATA** Macq., wing.
5. **VOLUCELLA MEXICANA** Macq., wing; 5*a*, head of male.
6. **VOLUCELLA EVECTA** Walk., wing; 6*a*, head of male.
7. **VOLUCELLA**, sp.
8. **VOLUCELLA** sp., head of male.
9. **VOLUCELLA COMSTOCKI** Will., head of male.
10. **VOLUCELLA EUGENIA** Will., head of male.
11. **VOLUCELLA SEXPUNCTATA** Loew.
12. **VOLUCELLA SATUR** O. S., wing neuration; 12*b*, antenna.
13. **VOLUCELLA TAU** Bigot, antenna.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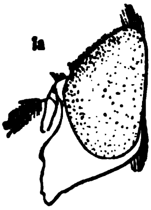
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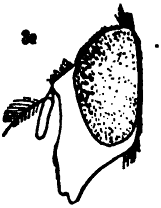
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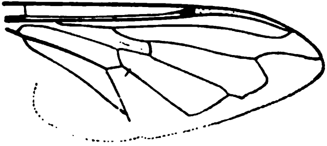
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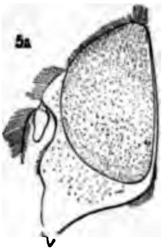
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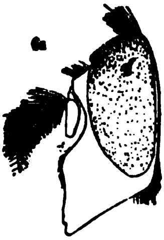
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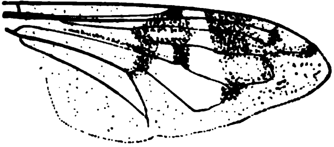
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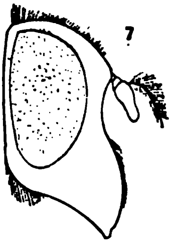
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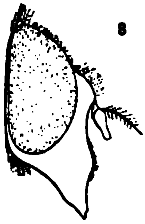
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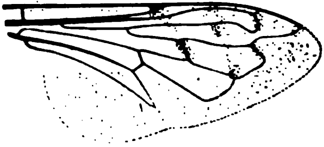
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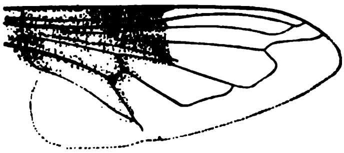
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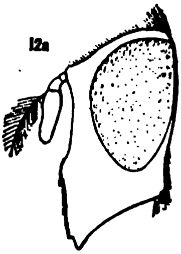
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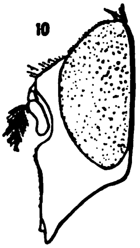
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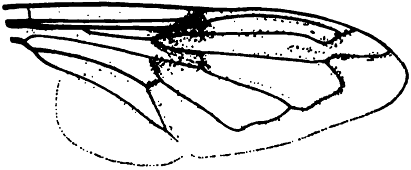
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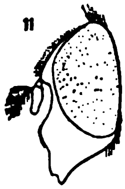
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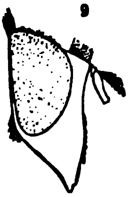
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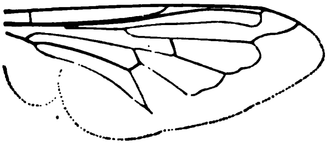
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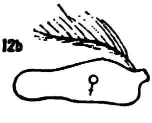
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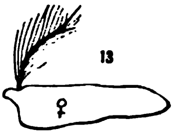
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PLATE VII.

1. COPESTYLUM MARGINATUM Say, wing; *1a*, head of female; *1b*, anten
2. SERICOMYIA CHALCOPYGA Loew, wing; *2a*, head of male.
3. SERICOMYIA MILITARIS Walker, wing; *3a*, hind leg of male; *3b*, hea
4. SERICOMYIA CHRYSOTOXOIDES Macq., antenna of male; *4a*, antenna
5. ARCTOPHILA FLAGRANS O. S., wing; *5a*, head of male; *5b*, hind leg
6. TEUCHOCNEMIS BACUNTIUS Walk., wing.
7. ERISTALIS TENAX Linné, wing; *7a*, head of male; *7b*, antenna; *7c*,
male.
8. ERISTALIS TRANSVERSUS Wied., head of male.
8*a*. ERISTALIS VINETORUM Wied., hind leg of male.
9. ERISTALIS COMPACTUS Walker, head of female. .
10. ERISTALIS HORTORUM Fabr., wing.

PLATE VII.

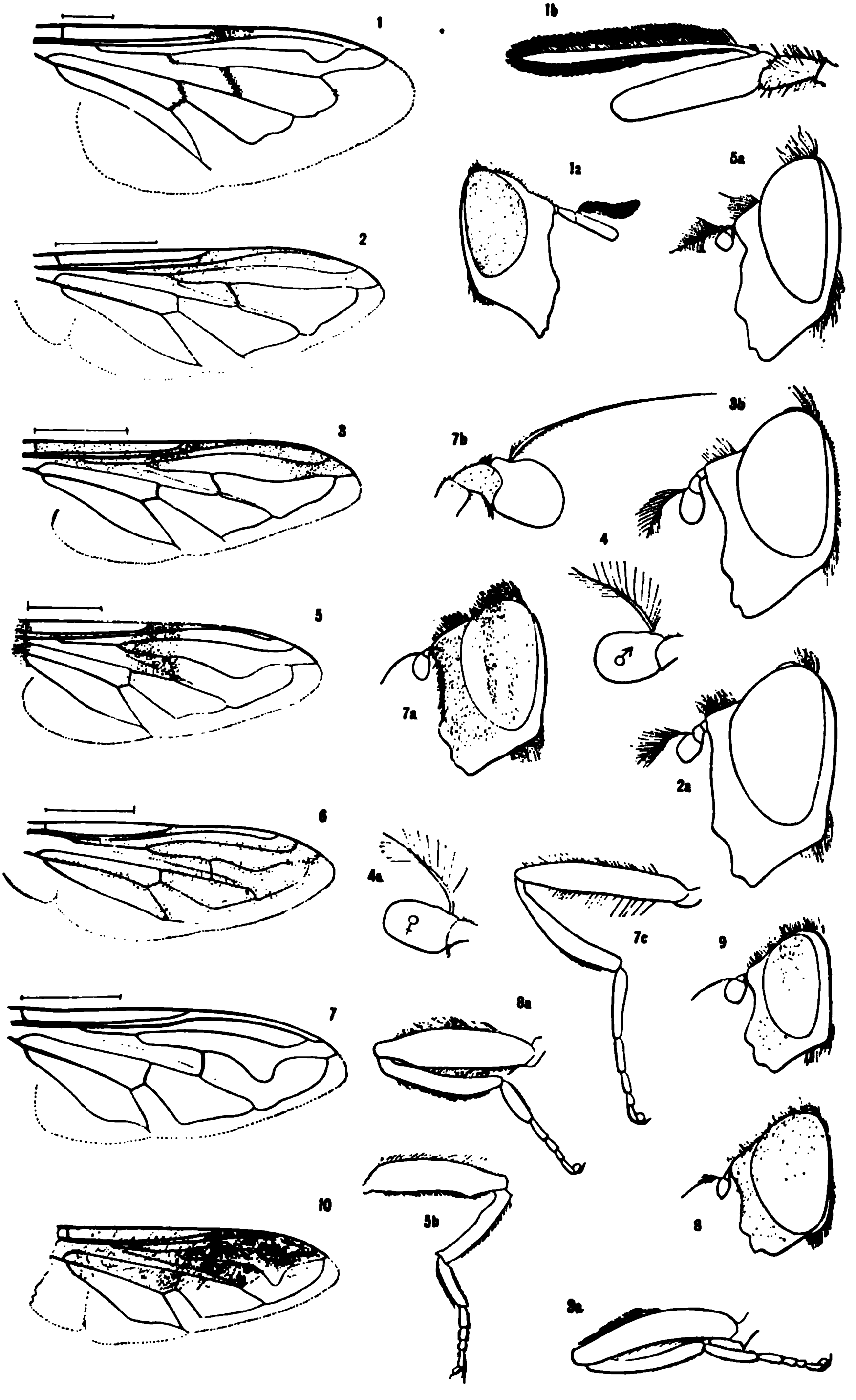


PLATE VIII.

1. Pteroptila crucigera Wied., wing; 1*a*, distal end of male abdom
leg of male; 1*c*, head of male.
2. Helophilus similis Macq., wing.
3. Helophilus conostomus Will., head of female; 3*a*, wing.
4. Helophilus modestus Will., head of female.
5. Helophilus chrysostomus Wied., hind leg of male.
6. Helophilus lætus Loew, head of male.
7. Helophilus mexicanus Macq., head of male; 7*b*, the same, front v
8. Doliosyrphus Rileyi Will., head of male.
9. Pterallastes thoracicus Loew, head of male; 9*a*, hind leg of ma
11. Mallota cimbiciformis Fall., hind leg of male; 11*a*, head of male.
12. Teuchocnemis lituratus O. S., hind leg of male; 12*a*, wing.
13. Mallota posticata Fabr., hind leg of male.
14. Mallota Sackeni Will., wing.

PLATE VIII.

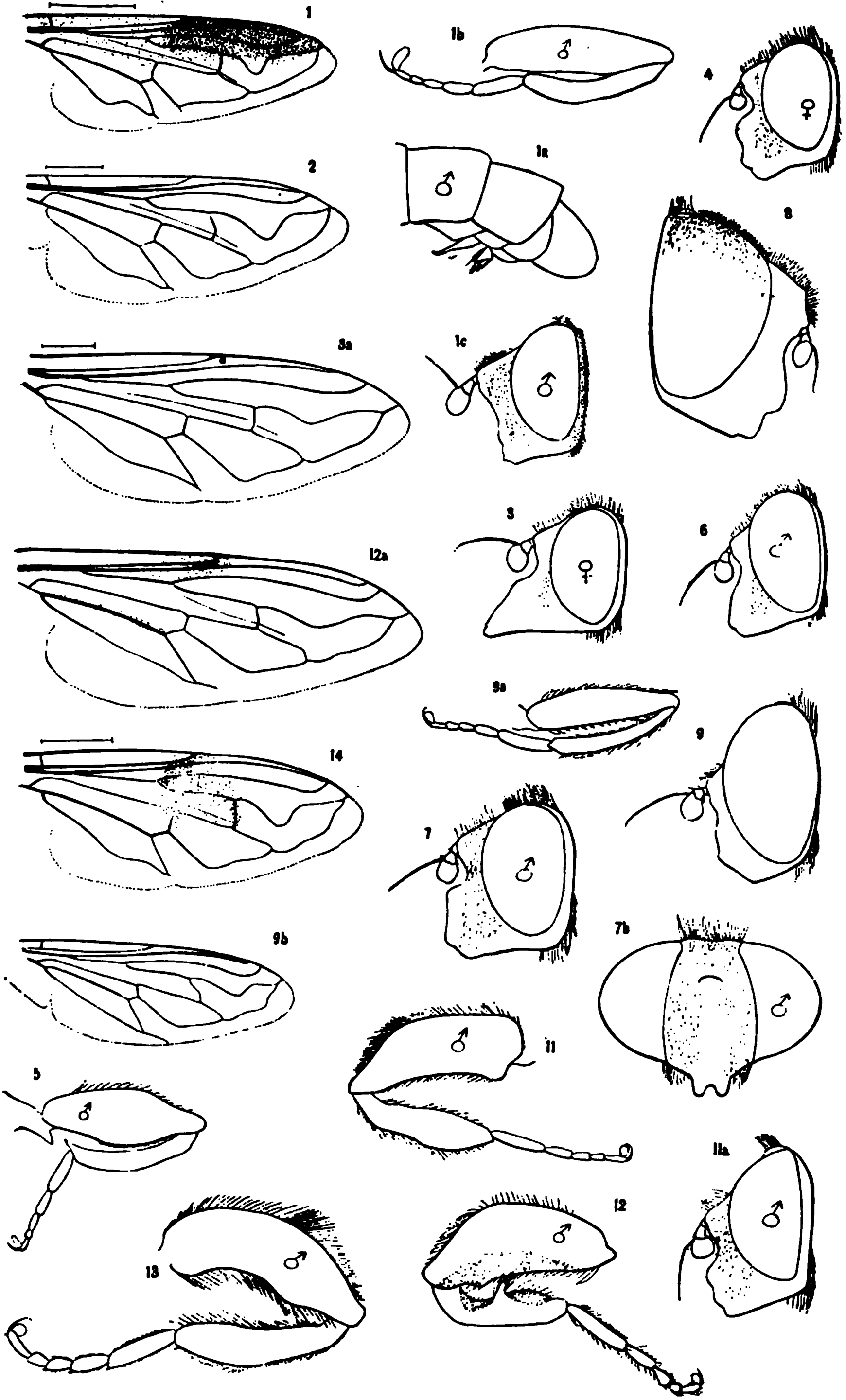
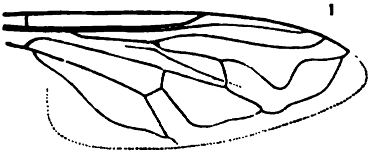


PLATE IX.

1. TRIODONTA CURVIPES Wied., wing; *1a*, head of male, front vi
   male; 1*c*, hind leg of male; 1*d*, hind leg of female.
2. TROPIDIA QUADRATA Say, wing; 2*a*, head of male; 2*b*, hind leg
3. CRIORHINA ANALIS Macq., wing.
4. CRIORHINA HUMERALIS Will., wing; 4*a*, head of male.
5. CRIORHINA SCITULA Will., head of male.
6. CRIORHINA LUPINA Will., female; 6*a*, head of male, front view
   side view.
7. CRIORHINA UMBRATILIS Will.
8. MALLOTA CIMBICIFORMIS, form BAUTIAS Walk., hind leg of male.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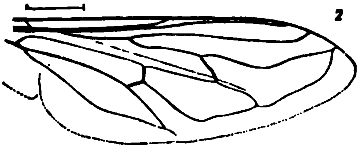
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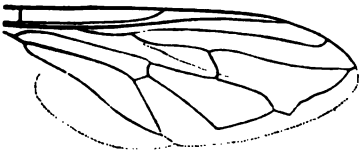
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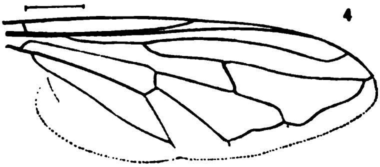
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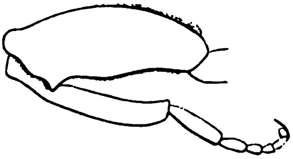
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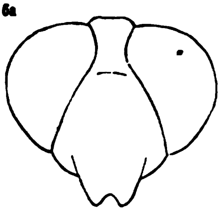
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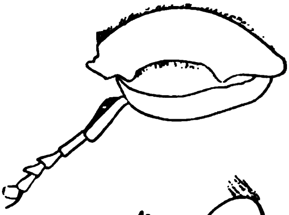
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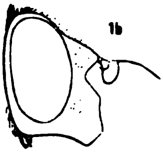
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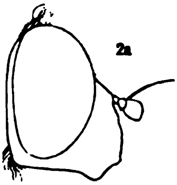
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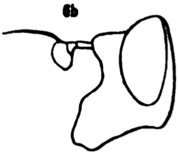
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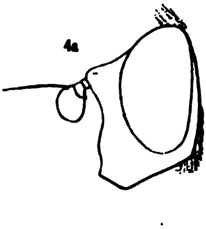
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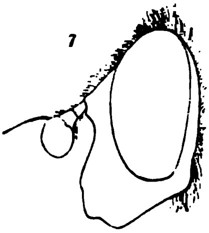
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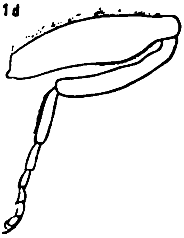
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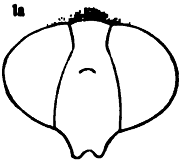
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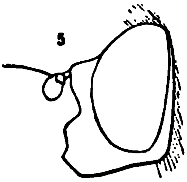
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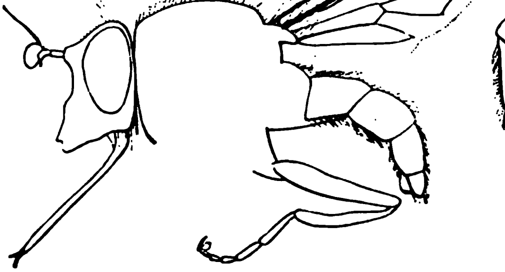
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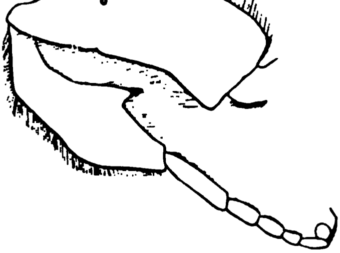
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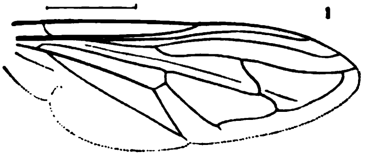
PLATE X.

1. CRIORHINA NIGRIPES, Will., wing; 1*a*, head of female (the angle
   and occiput is too much rounded); 7*b*, the same, front view.
2. CRIORHINA VERBOSA Harris, antenna.
3. CRIORHINA (SOMULA) DECORA Macq., wing; 3*a*, head of male; 3*b*, t
   view.
4. CRIOPRORA CYANELLA O. S., wing (♀); 4*a*, hind leg of male; 4*b*, h
   male.
5. CRIOPRORA FEMORATA Will., head of male; 5*a*, hind leg of male.
6. CRIOPRORA CYANELLA O. S., head of female.
7. POCOTA GRANDIS Will., head of male; 7*a*, wing.
8. BRACHYPALPUS FRONTOSUS Loew, hind leg of male.
9. BRACHYPALPUS (CALLIPROBOLA) PULCHER Will., head of male, 9a,
   wing.

PLATE X.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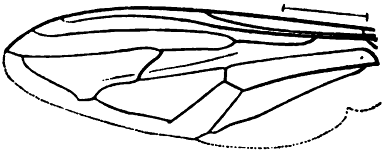
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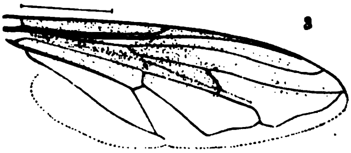
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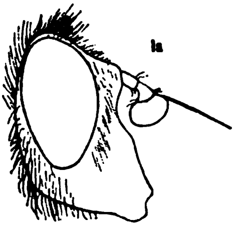
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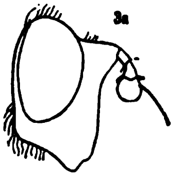
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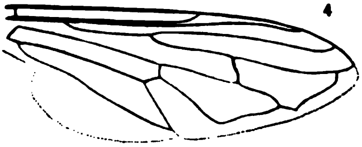
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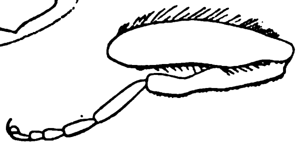
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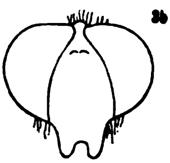
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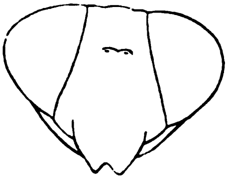
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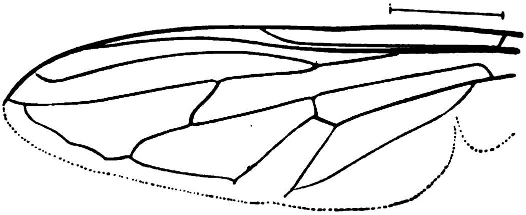
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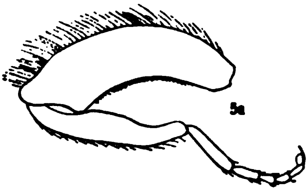
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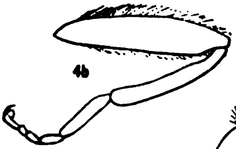
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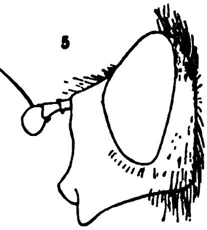
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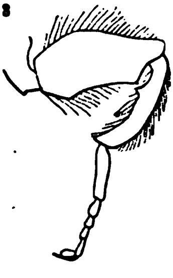
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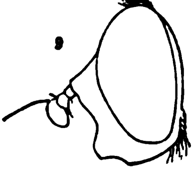
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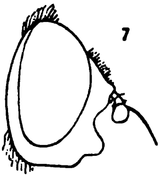
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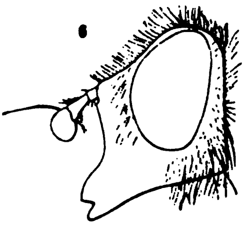
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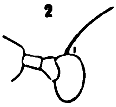
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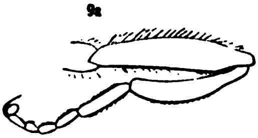
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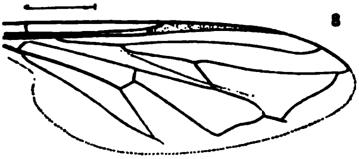
PLATE XI.

1. Senogaster Comstocki Will., male; 1*a*, wing; 1*b*, head of
2. Merapioidus villosus Bigot, head of female; 2*a*, wing.
3. Xylota pigra Fabr., wing.
4. Eumerus sabulonum Fallen (Europe), wing; 4*a*, head of m
5. Chrysochlamys dives O. S., wing; 5*a*, head of male.
6. Xylota flavitibia Bigot, hind leg of male.
7. Xylota pigra Fabr., hind leg of male; 7*a*, head of male.
8. Xylota ejuncida Say, wing; 8*a*, hind leg of male.
9. Xylota angustiventris Loew, head of male.
10. Brachypalpus frontosus Loew, head of male (the posteri
    above).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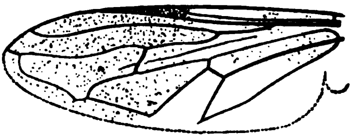
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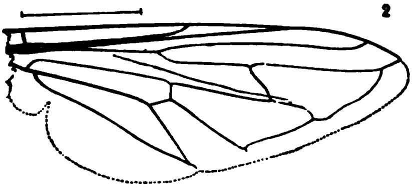
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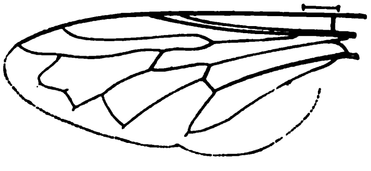
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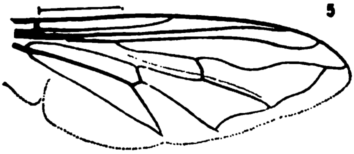
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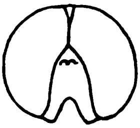
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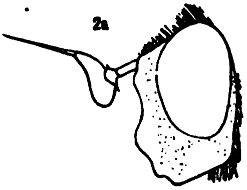
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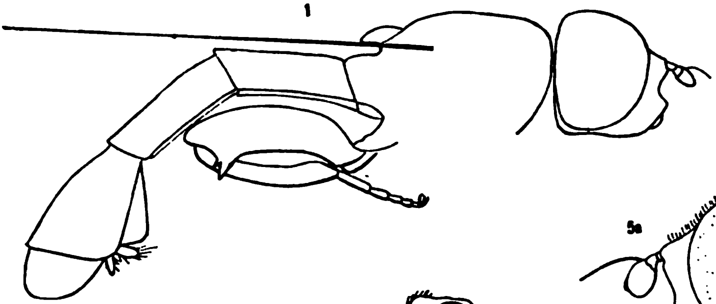
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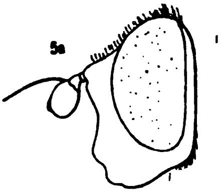
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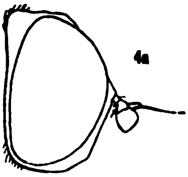
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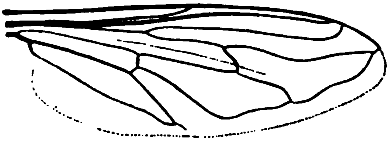
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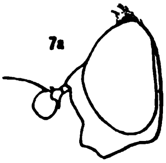
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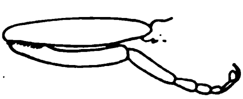
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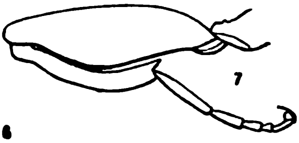
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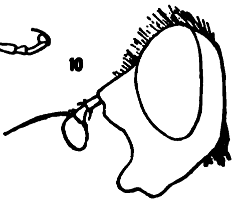
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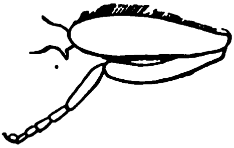
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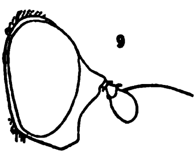
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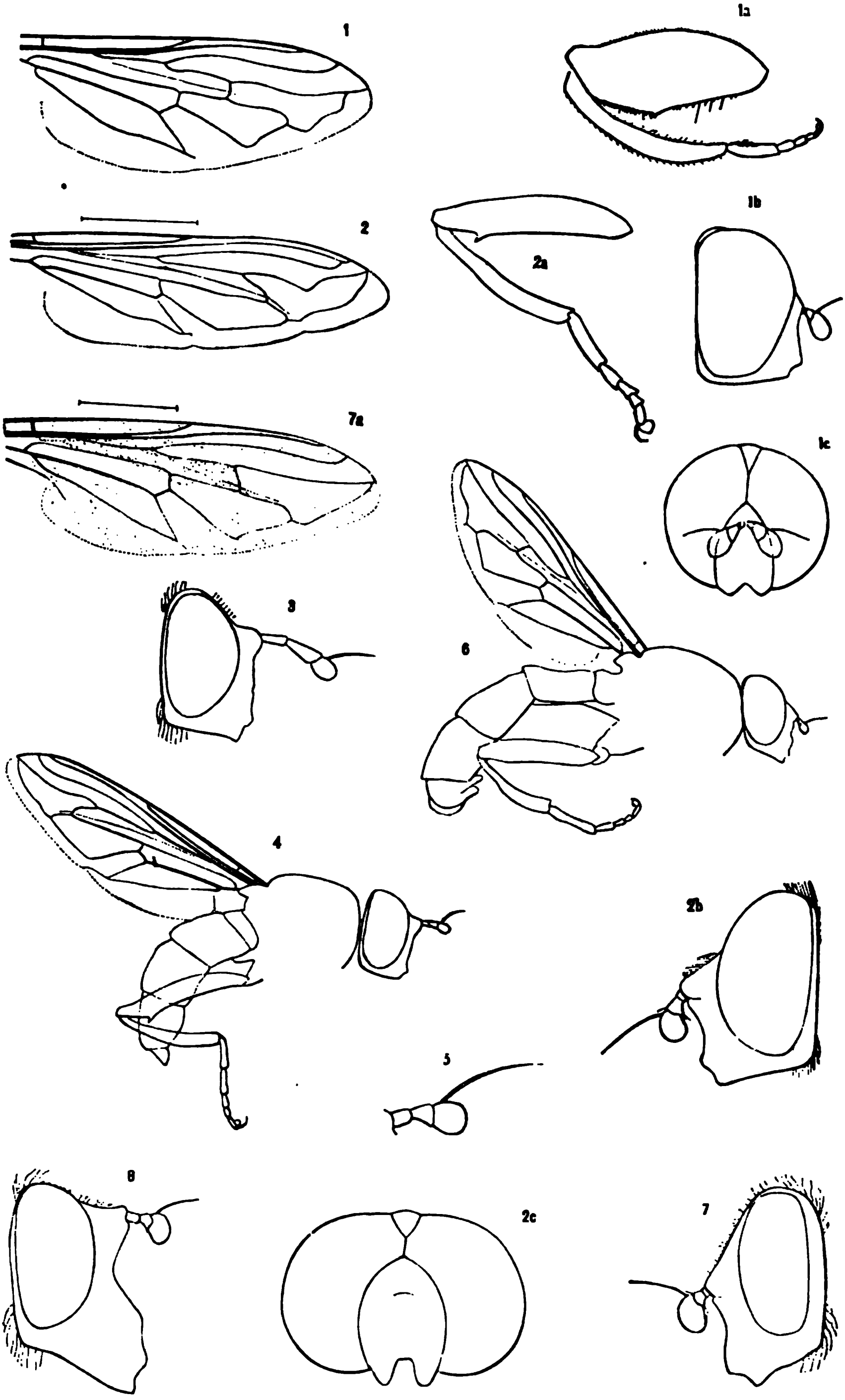
PLATE XII.

1. **SYRITTA PIPIENS Linné, wing; 1*a*, hind leg of male; 1*b*, head**
   same, front view.
2. **MILESIA ORNATA Fabr., wing; 2*a*, hind leg.**
3. **SPILOMYIA QUADRIFASCIATA Say, head of male.**
4. **SPILOMYIA INTERRUPTA Will., male.**
5. **SPILOMYIA FUSCA Loew, antenna (the third joint is a little too**
6. **TEMNOSTOMA BOMBYLANS Fabr., male.**
7. **TEMNOSTOMA ALTERNANS Loew, head of female.**
8. **SPHECOMYIA PATTONI Will., head of male; 7*a*, wing.**

PLATE XII.



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